Report of the International Review Committee on the Meeting at the Hiroshima Synchrotron Radiation Center

March 14-15, 2024

Review of Scientific Research

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Executive Summary

The International Review Committee (IRC) met at Hiroshima University on March 14-15, 2024, to review the scientific programs and the future plan of HiSOR. The IRC had been provided with extensive background material before the meeting and complementary information during the review.

The HiSOR management and scientists were most helpful in answering questions and providing extra materials requested during the review and the IRC commends the Director for a very professionally organized meeting. The IRC also wants to express its gratitude for the hospitality it was shown throughout its stay at HiSOR.

The review was in conjunction with the 28th Hiroshima International Symposium on Synchrotron Radiation. This allowed the IRC to listen to a number of excellent presentations by HiSOR scientists and users and interact with young scientists at a poster session that gave a very nice survey of recent research activities. The posters were very informative and consistently of excellent quality. The IRC was impressed by the high motivation of the young students involved in HiSOR research activity.

In the opening address to the Symposium the Vice President of Hiroshima University, Professor Atsushi Sugeta underlined the important role of HiSOR for research and education at this University. The IRC was impressed by the commitment the University Administration has to the success of HiSOR. He further explained that HiSOR has become a crucial part of the new national funding, the J-Peak program, which started this year to enhance the research and industrial cooperation of outstanding universities. Hiroshima University plans to enhance its collaboration with semiconductor, meta matter, and bionanotechnology industries utilizing HiSOR, which is a unique synchrotron radiation facility among Japanese universities.

The Director of HiSOR, Professor Kenya Shimada, gave a most impressive summary of the research activities during the last five years. The scientific productivity is remarkable with a reasonable number of publications, a significant fraction in the most distinguished peer-reviewed physics, chemistry, and biology journals. IRC was particularly impressed by the effort of HiSOR for a consistent operation during the COVID-19 period and a quick recovery afterward in its scientific productivity and user activity.

HiSOR has been highly successful in the implementation of the “Joint Usage” format imposed by MEXT of Japan, in which HiSOR staff scientists are directly involved in the collaborative research triggered by external users in addition to their own research activity. The IRC congratulates HiSOR to this success and strongly recommends that the “Joint Usage” format is continued with a proper support from MEXT and Hiroshima University. The IRC also acknowledges that collaborations with world-renowned international researchers account for about 63% of the publications produced and are established solidly as an important part of the HiSOR operation. The IRC thinks that HiSOR has contributed to the development of VUV synchrotron-radiation-based science of the world. HiSOR is in an excellent position to further expand these activities in attracting world-leading researchers and to enhance Japan's role in global scientific collaboration.

The IRC finds that HiSOR is doing exceptionally well in the maintenance and continued upgrades of the accelerator systems, the beamlines, the end-stations, and off-line supporting facilities; in particular considering the largely-limited number of staff and operating cost.

The IRC is highly impressed by the number of graduate students who got their master's and doctoral degrees based on works using HiSOR, which amounts to 50 and 33 students, respectively in 2017-2023. This number is gradually increasing demonstrating the increasing educational contribution of HiSOR. This outcome fits ideally to the expected role of a synchrotron radiation source belonging to a University.

Professor Shimada emphasized five focused research areas for HiSOR, on each of which the corresponding HiSOR staff reported a more detailed summary of the activity.

- High-Resolution Photoemission Spectroscopy for Electronic Structure Analysis
- Spin-Resolved Photoemission for Spin Structure Analysis
- Soft X-Ray MCD of Surface Nano Structures
- VUV Circular Dichroism Spectroscopy of Biomolecules
- Light Sources Accelerators and Insertion Devices

The IRC summarizes its opinion on the HiSOR activity in the above five research areas as follows.

High-Resolution Photoemission Spectroscopy for Electronic Structure Analysis
The rotation of the BL-1 main chamber around the light incidence allows for a unique setup where the degree of linear polarization remains at 100% all the time. Such a polarization-dependent ARPES measurement enables users to disentangle multi-band systems and the orbital texture of each band based on the dipole selection rule. The dramatically decreased beam spot size, new nano stage, and new analyzer enable users to perform the most precise measurements.

The high-resolution variably polarized low-energy photons from the APPLE-II undulator at BL-9A provide an excellent environment to investigate fine details in the electronic structure near the Fermi level. The installation of the fully motorized 6-axes goniometer and the new analyzer with a wide detector angle (ultimately ±30 deg, presently operating at ±19 deg) enables users to cover significant ranges of k-space for high-quality ARPES measurement, which is more challenging at low photon-energy. The electrodes installed in the manipulator provide exciting opportunities for researchers to do in-operando measurements.

The recently commissioned μ-Laser ARPES machine has proven to be a highly competitive setup and has gotten much attention from different groups inside and outside of Japan for its attractive combination of spatial, angular, and energy resolution.

Spin-Resolved Photoemission for Spin Structure Analysis

Equipped with a very-low-energy-electron-diffraction (VLEED) spin detector, that was developed in-house with an order-of-magnitude-higher efficiency than a conventional high-energy Mott spin detector, and Apple II undulator synchrotron radiation in a very efficient photon energy range, HiSOR has been one of the most active and competitive centers for spin-resolved ARPES (S-ARPES) research in the world.

In his talk Dr. Miyamoto gave a status report of this facility. The VLEED spin-resolved ARPES system has demonstrated an energy resolution of $\Delta E \leq 10$ meV, an angular resolution of 0.4° and the capability of 3D spin vector analysis, which are among the highest resolutions reached in spin-resolved ARPES in the world and enables precise spin-resolved measurements that require high energy and angular resolutions.

The versatile sample facilities permit the preparation of a variety of samples efficiently, which was updated with lower-temperature capability down to 6 K.

The system was further upgraded by reducing the beam size on the spot by 1/10 (500×100 micron scale) with a capillary mirror. This will be important for various exfoliated 2D materials and in-operando measurements.

The IRC also heard about the construction of an extra off-line spin-ARPES system using 6-eV laser, which provide higher energy and momentum resolution, a different photon energy range, and a much higher spatial resolution of 5 micron. The IRC agrees that this system is a powerful complement to the existing spin-ARPES beamline facility in various ways.

The IRC is impressed by the continued upgrade of the system and the continued production of high-level research results and publication by the internal group, domestic users and international users.

The IRC also find that the on-going development of the VLEED spin detector system utilizing multi-channel spin detector would be another important contribution of HiSOR to the world community when it is successfully constructed.

Soft X-Ray MCD of Surface Nano Structures

In the light of the publication and proposal record provided over the last 5 years (2018-2023), BL14 beamline and XMCD endstation have successfully accomplished remarkable results over the period, with around 10-15 manuscripts in good quality peer review journals (plus some recent excellent results pending publication in judgment of the results shown in the 28th HiSOR meeting). The talk by Dr. Masahiro Sawada (BL14 scientist), and the additional user presentation by Dr. Naoyuki Maejima (from Rikkyo University and Institute of Molecular Science presentation) highlighted the use of XAS and XMCD approaches on the investigation of hybrid 2D/FM interfaces and Ni_xP/Fe_2P bilayers, evidencing excellent performance and the capability to complete cutting edge nanomagnetism studies.

Besides, a novel endstation for soft x-ray reflectometry is under installation and appears to be in large progress or almost ready for commissioning (no measurements were yet shown). This effort is commendable and well received: such an instrument enables complementary approaches to the XAS, XMCD techniques and broadens the beamline usage, offering novel opportunities and widens the portfolio of techniques at the service of the HiSOR community.

Looking back at the recommendations for XMCD endstation already made by the International Review Committee back in 2018 (see related 2018 report), one finds: i) extension of the cryogenic temperatures below liquid nitrogen (i.e. liquid Helium); ii) implementation of a larger (high) field magnet, either a superconducting magnet or a high field magnet; iii) addition of a fluorescence sensor for measurements on insulating samples. Such recommendations still apply now in 2024, and will be the highest priority recommendations for BL14. We advise to look onto cryogen free solutions (cold gas recirculation, recondensing), 2T fast ramp (2T/s) electromagnets for fast field switching (especially if polarization switching remains unavailable) and implement even low-cost simple diode-based fluorescence, transmission/x-ray excited luminescence detection which are really low cost but provide a lot of additional information or solutions to insulating samples, operando studies.

It is too early to provide recommendations on the soft x-ray reflectometry endstation, but addition for a 2D detector (CCD, sCMOS) enabling off-plane resonant scattering (transmission, GISAXS, but in soft x ray range even grazing angle is not so relevant or interesting) is worth start thinking about. This would become even more relevant if HiSOR is updated to a synchrotron source with enhanced coherence.

It feels urgent to increase staffing of the beamline to further boost the already good productivity of the beamline and XMCD endstation, which will become even more relevant in the context of an eventual machine upgrade. One way will be fostering the participation of the beamline scientist on national research grants as PI, in collaboration with other researchers, in order to have shared PhDs and postdocs.

The beamline upgrades should take into account the possibility of an updated HiSOR machine, so any significant investment of money and resources is also useful and well adapted to such eventual novel scenario and the corresponding beamline or endstations conditions (which may differ from present).

VUV-CD Spectroscopy of Biomaterials

BL-12 represented by Dr. Koichi Matsuo has been and still is proof of a well functioning beamline. The field of interest includes the biophysical and structural biology. BL-12 offers a continuous operation during the working hours, allowing circular (CD) and linear (LD) dichroism as well as absorption spectroscopy. The vacuum-ultraviolet (VUV) CD spectrophotometer at BL-12 extends the CD spectra to the VUV region down to 170 nm for aqueous solutions and to 140nm for films. Low noise, low sample consumption (microliter range) and quick data acquisition provide structural information, that is unattainable with conventional CD instruments. Applications include membrane proteins, saccharides, nucleotides and disordered protein structure analysis, as well as protein-protein interactions, protein-nucleotide interactions and protein lipid interactions.

The group of Dr. K. Matsuo has been joined by a Dr. Mohamed Ibrahim (assistant professor), who has been a real asset considering that he has already published! Also, like previously (2018) stated, the recruitment and of new beamline-staff increases the possibilities for exploring the beamline as well as accommodating and helping users and recruiting students more efficiently. I have been impressed by the present output 17 papers and usage of the VUV-CD. Keeping in mind that there has certainly been an interruption during the COVID pandemic and its restrictions.

Developments in place such as the vertical acquisition dispositive including a Schwartzschild focusing lens, microfluidic devices controlling the protein membrane dynamics (time resolved), as well as multi well plate reading and last but not least a Cuette flow cell for analysis of macromolecular orientation within liquid samples are new methodologies and devices, which add up to the existing equipment such as the sublimation chamber, for thin film preparations of organic chiral molecules, and microfluidic continuous flow and stopped flow set-ups.

The installation of an automated temperature stepping mode (-20℃ to 100℃) for CD and absorption spectroscopy is now in place and allows access to thermodynamics and thermal-stabilities assays of biological macromolecules in solution. Further developments which have been discussed with the beamline staff include the development and implementation of a dedicated linear dichroism.

The latest addition of the ChiroPoly Probe system for real-time monitoring of CD signals from free radical polymerisation processes will be a great asset also to attract scientist from chemistry backgrounds in addition to life scientists.

The IRC strongly supports the investigations into these novel developments to pave the way for a new HiSOR light source. VUVCD will be an essential part of the new beamlines in the potential upgrade to HiSOR-II.

In a conclusion, important improvements over the past 6 years have been made. BL-12 remains and is a very productive tool for structural biology, glyco-biology and in a more general way for chrial macro-molecular studies where other techniques fail due to size of the molecules or their complicated flexible structures.

Light Sources Accelerators and Insertion Devices

The IRC is impressed by the performance of the HiSOR light source despite its age of 28 years and being operated by a very small accelerator group. Pursuing aging-related issues with high priority and updating the control system are measures which are highly appreciated. Replacement of the presently leaking copper absorber should also be considered for the other dipole as a preventive measure.

The Director of HiSOR explained future storage ring options with a circumference ranging from 40 to 50 m for a diffraction-limited new facility HiSOR-II with six straight sections. The IRC fully agrees that technical improvement of this already very optimized machine is hardly possible and stable operation is becoming more and more difficult, while the research opportunities in physics, chemistry and biology offered by HiSOR are indispensable. Given the time scale for designing, constructing and commissioning a new light source, the IRC strongly recommends that the Hiroshima University decides on future plans for HiSOR as soon as possible and forwards them to the MEXT level.

Investment in HiSOR pays best when that machine is used to full capacity. The present operation time of 1600 hours per year for users may suggest that the demand for such a light source is not very high. In order to avoid such an impression and as requested by the users, HiSOR should make an effort to operate for more hours. The IRC understands that operation time is limited by manpower, HiSOR may consider the options that have been successfully practiced at other light sources. That is, leaving the machine unattended after the last injection, and training students as operators. The latter has the positive side-effect that more students get interested in master/doctoral work at HiSOR.

Not only the beamlines but also the accelerator physics group would profit from additional manpower, particularly when preparing a Conceptual Design Report to apply for a new machine. A sound concept for such a machine requires detailed simulations including nonlinear effects and a professional technical layout of accelerator components. The IRC recommends funding for one additional accelerator physicist and at least one more engineer or technician.

Future of HiSOR

The Director of HiSOR explained the future plan of the HiSOR, which mainly focuses on the construction of a new synchrotron to replace its 28-year-old machine. The IRC agrees fully with the fact that the old synchrotron is not very close to ending its lifetime and the continuation of a stable operation would become more and more difficult from now on. This will make the continuation of the very high-quality domestic and international research activity in HiSOR impossible in near future. The IRC also fully agrees that the research opportunity offered by HiSOR is indispensable in the physics, chemistry, and biology community worldwide and cannot be replaced by other facilities. Considering the long time for the construction of a new synchrotron radiation facility, the IRC strongly recommends that the future plan of HiSOR be decided as soon as possible at the Hiroshima University and MEXT level. The current plan proposed by HiSOR Director is to make a new compact synchrotron radiation source with an electron energy of 500 MeV and four to six undulators. The IRC acknowledge that this is a reasonable and strategic plan to compromise the budget/man-power situation and the scientific opportunity. The IRC strongly supports the future plan of HiSOR.

Pohang, March 30, 2024.
Han Woong Yeom
Chair, on behalf of the IRC

Introduction

The Hiroshima Synchrotron Radiation Center, HiSOR, is the only synchrotron radiation facility that is attached to a national university in Japan. It was established in 1996, as part of the academic policies of the Japanese government. The mission of HiSOR is to promote advanced research in the field of condensed matter physics and biomolecule research using synchrotron radiation in the ultraviolet and soft x-ray range, as well as to develop human resources. In 2010, HiSOR was authorized as a “Joint Usage / Research Center” by the Ministry of Education, Culture, Sports, Science and Technology (MEXT). As a result of extensive research activities in collaboration with researchers from inside and outside of Japan, HiSOR was graded “A” for the 1st term-end evaluation in 2015 and “A$^-$” in 2022 by the MEXT. In 2016, the authorization as the Joint Usage / Research Center was extended for 6 more years. The mid-term evaluation is planned in 2024.

According to this authorization, HiSOR is focusing on the following research:

1. Research on quasiparticles by ultrahigh resolution photoemission spectroscopy
2. Research on spin structures by spin- and angle-resolved photoemission spectroscopy
3. Structural analysis of biomolecules in solution by VUV-CD
4. In situ fabrication and characterization of magnetic nanostructure by SXMCD
5. R&D for a compact low-emittance light source

In this context the International Review Committee (IRC) was charged to evaluate the scientific research activities at HiSOR. Below is a detailed assessment of the five research areas listed above.

The IRC had been provided with extensive background materials in advance of the evaluation that took place March 14-15, 2024. The evaluation was in conjunction with the 28th Hiroshima International Symposium on Synchrotron Radiation. This gave the IRC an excellent opportunity for insights into the activities at HiSOR. In the opening address the Vice President of Hiroshima University, Prof. Sugeta, emphasized the important role of HiSOR for research and education at Hiroshima university. Dr. Shimada, the director of HiSOR, gave a clear perspective of the present activities and future plans for the facility. Five HiSOR scientists, Drs. Miyamoto, Sawada, Matsuo, Ideta and Kato gave presentations of the key areas of the research. In a lively poster session with 32 contributions, young researchers presented their results on well-prepared posters. The IRC greatly appreciated the opportunity to interact with the enthusiastic and highly motivated students.

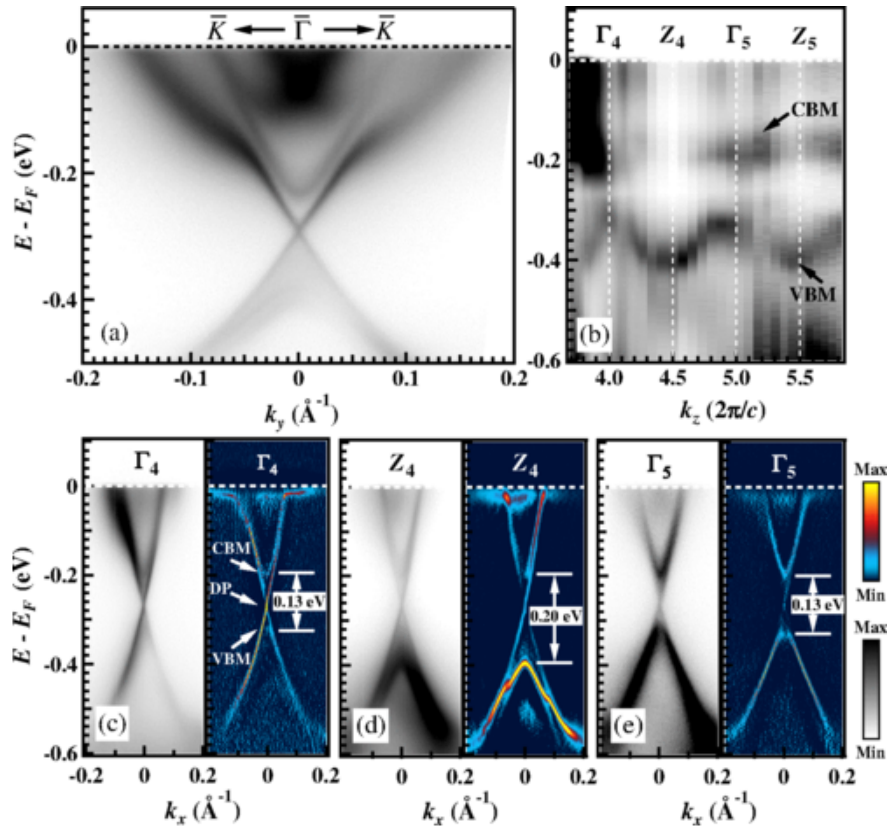
During the evaluation process on March 14 the HiSOR management was most helpful in answering all the questions and requested clarifications from the IRC members. The IRC wants to express their sincere thanks to the management for its extended efforts in making the evaluation process both informative and transparent.

Research Highlights

1-1. High resolution ARPES (BL-1, BL-9A, and laser PES)

Y.-J. Hao et al., "Gapless surface Dirac cone in antiferromagnetic topological insulator $MnBi_2Te_4$", Phys. Rev. X 9, 041038 (2019).

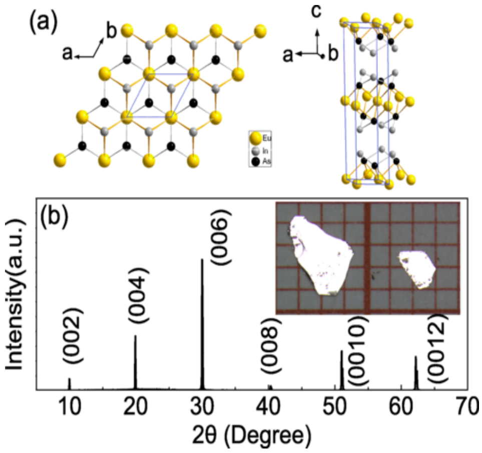
By using high-resolution angle resolved photoemission spectroscopy, a gapless Dirac cone at the (0001) surface of $MnBi_2Te_4$ has been observed inside the bulk band gap. Such an unexpected surface state remains unchanged across the bulk Néel temperature, and is even robust against severe surface degradation, indicating additional topological protection. These results unveil the experimental topological properties of $MnBi_2Te_4$, revealing that the intrinsic magnetic topological insulator hosts a rich platform to realize various topological phases by tuning the magnetic or structural configurations, and thus push forward the comprehensive understanding of magnetic topological materials.



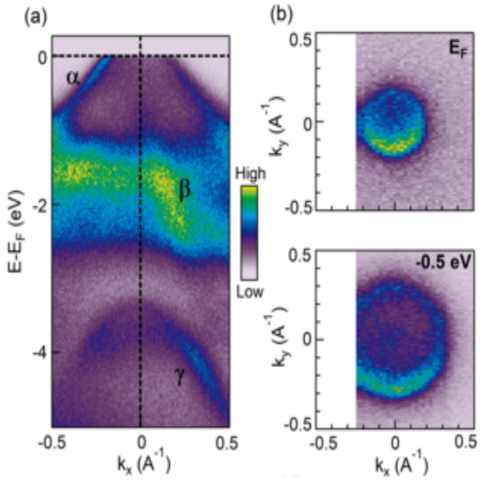
Surface and bulk electronic structure of $MnBi_2Te_4$. ARPES intensity plots are taken at $h\nu = 6.3$ eV, $T = 10$ K.

Y. Zhang et al., "In-plane antiferromagnetic moments and magnetic polaron in the axion topological insulator candidate $EuIn_2As_2$", Phys. Rev. B 101, 205126 (2020).

A systematic study of the axion topological insulator candidate $EuIn_2As_2$. A linear energy dispersion across the Fermi level reveals a hole-type Fermi pocket. The orientation of the magnetic moment for ground state is determined within the ab-plane by anisotropic magnetic behavior. Besides long-range antiferromagnetic order, magnetization and magnetotransport measurements indicate existence of the ferromagnetic orders and ferromagnetic correlation, suggesting the formation of the magnetic polarons. These ferromagnetic clusters can persist above the antiferromagnetic transition leading to unconventional transport properties.



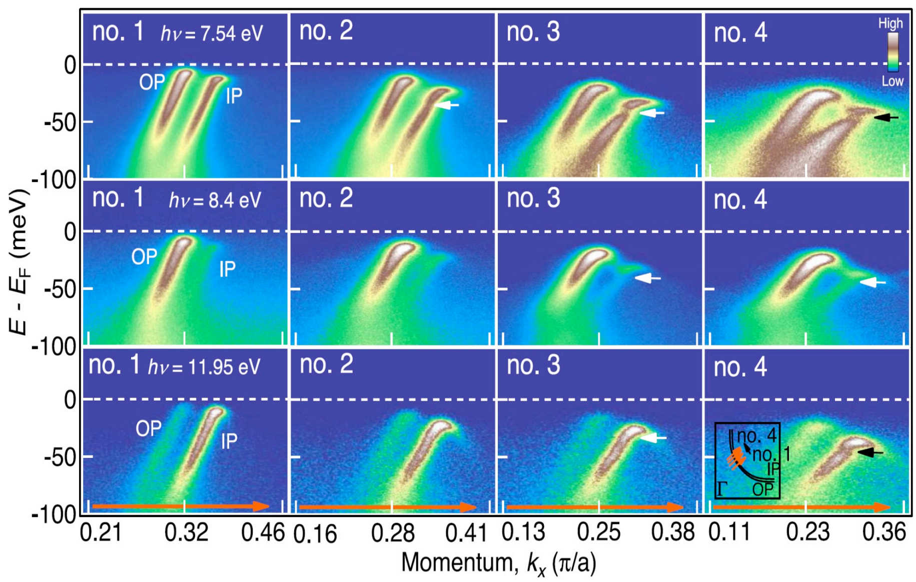
Crystal structure of $EuIn_2As_2$.



Valence band structure along the K-Γ-K direction and Fermi surface map.

S. Ideta et al., "Hybridization of bogoliubov quasiparticles between adjacent CuO_2 layers in the triple-layer cuprate $Bi_2Sr_2Ca_2Cu_3O_{10+\delta}$ studied by angle-resolved photoemission spectroscopy", Phys. Rev. Lett. 127, 217004 (2021).

Hybridization of Bogoliubov quasiparticles (BQPs) between the CuO_2 layers in the triple-layer cuprate high-temperature superconductor $Bi_2Sr_2Ca_2Cu_3O_{10+\delta}$ is studied by angle-resolved photoemission spectroscopy (ARPES). In the superconducting state, an anticrossing gap opens between the outer- and inner-BQP bands, which we attribute primarily to interlayer single-particle hopping with possible contributions from interlayer Cooper pairing.

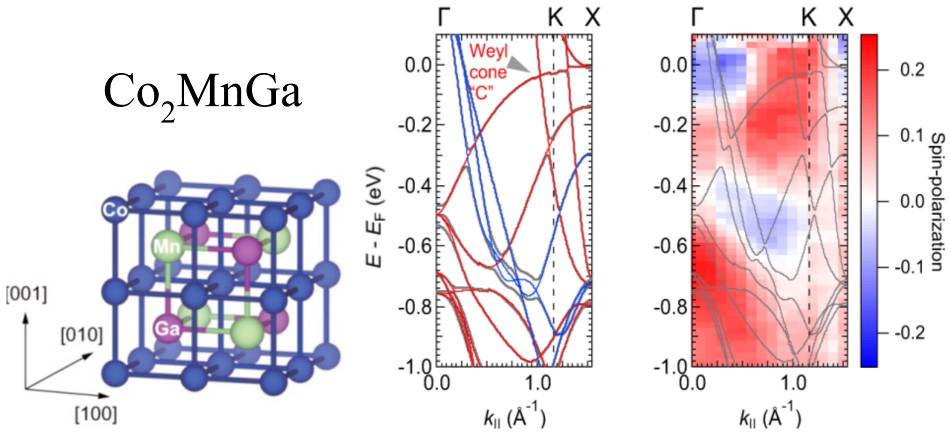


Momentum dependence of ARPES intensity plots taken at low photon energy in the triple-layer cuprate, $Bi_2Sr_2Ca_2Cu_3O_{10+\delta}$.

1-2. Spin-resolved ARPES (BL-9B, and laser spin-ARPES)

K. Sumida et al., "Spin-polarized Weyl cones and giant anomalous Nernst effect in ferromagnetic Heusler films", Commun. Matter 1, 89 (2020). [56 citations, Top 7%]

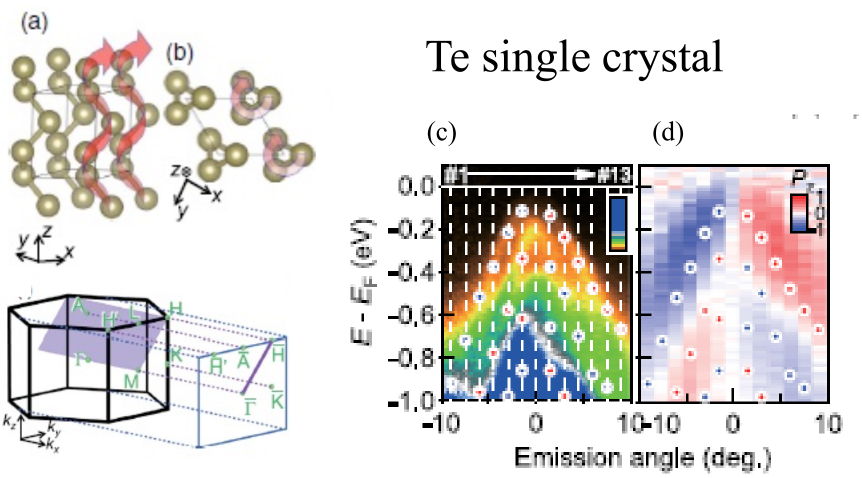
A Co_2MnGa Heusler alloy has been theoretically predicted to be a ferromagnetic Weyl semimetal and has been experimentally demonstrated in the bulk form to exhibit large anomalous transport properties under an external magnetic field. This research is the first observation of spin texture in the Heusler alloy and provided the reliable guiding principle to maximize the Nernst thermopower by the band engineering utilizing the SARPES, transport measurements, and ab initio calculations.



Crystal structure (Left), calculated band structure(middle) and the observed spin polarized map(right) of Co_2MnGa.

M. Sakano et al., "Radial Spin Texture in Elemental Tellurium with Chiral Crystal Structure", Phys. Rev. Lett. 124, 136404 (2020). [75 citations, Top3%]

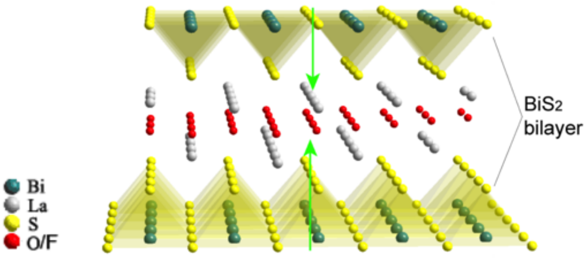
Several calculations studied on the nonmagnetic chiral materials have predicted that the peculiar spin texture should appear all around the highly symmetric k points, due to a lack of mirror symmetry and space inversion symmetry with a combination of spin-orbit interaction. This research clarified that the spin of chiral material Te exhibits a hedgehoglike texture, which leads to unconventional magnetoelectric effects, by spin- and angle-resolved photoemission spectroscopy.



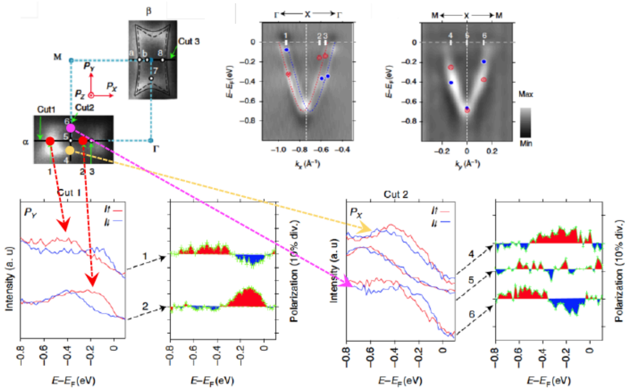
(a) (b) Left-handed chiral structure of Te. ARPES image and spin polarization near H in Brillouin zone for the left-handed crystal recorded at hν=18eV.

S. Wu et al., "Direct evidence of hidden local spin polarization in a centrosymmetric superconductor $LaO_{0.55}F_{0.45}BiS_2$" Nat. Commun.8, 1919 (2017). [51 citations]

Although it was believed that the Rashba (or Dresselhaus) effect is caused by the broken spatial inversion symmetry and strong spin-orbit interaction, it is predicted that there might be hidden spin-polarized electronic states even in the centrosymmetric materials by the local symmetry breaking (Zhang, X. et al. Nat. Phys. 10, 387–393 (2014).) This study reveals that such hidden spin-polarized electronic states exist in the newly discovered superconductor $LaO_{0.55}F_{0.45}BiS_2$, by using spin-resolved photoemission spectroscopy under surface -sensitive conditions.



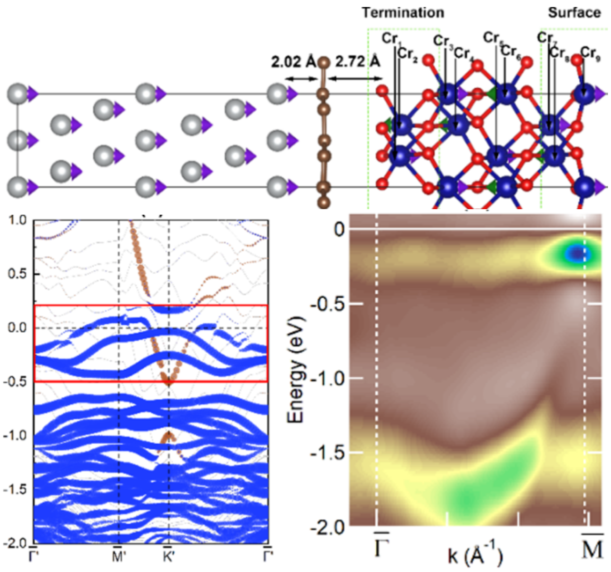
Crystal structure of $LaO_{0.55}F_{0.45}BiS_2$



Spin-ARPES results of $LaO_{0.55}F_{0.45}BiS_2$

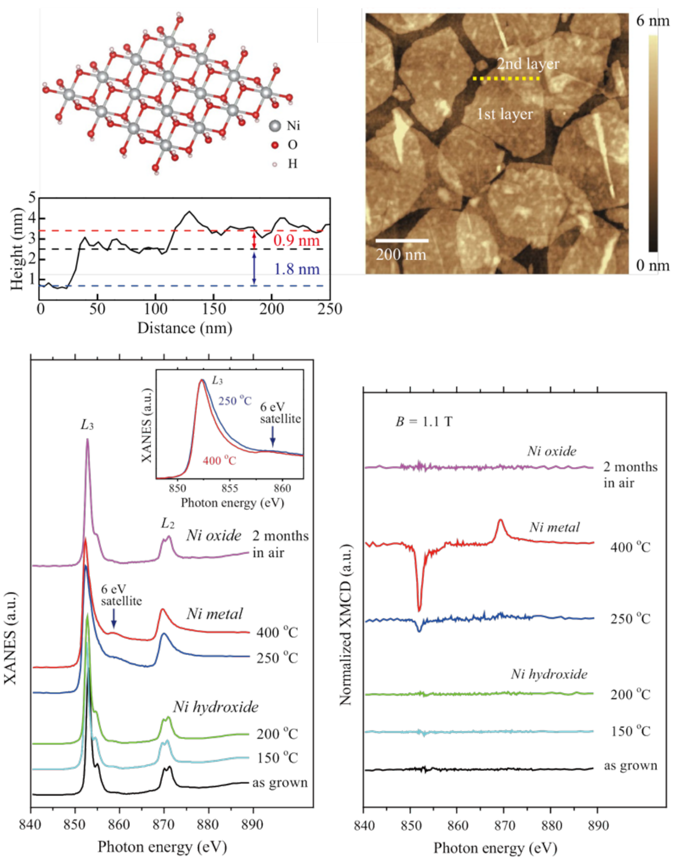
1-3. Nanomaterial analysis (BL-14)

X. Hou et al., "Observation of mid-gap states emerging in the O-terminated interface of Cr_2O_3/graphene: A combined study of ab initio prediction and photoemission analysis", Appl. Surf. Sci. 594 (2022) 153416.



Interfacial electronic structure between graphene and Cr_2O_3 film was investigated, whose magnetic state is important for spintronic applications. The oxygen terminated type of the interface (top) was confirmed, where spin polarized mid-gap states originated from the spin-up Cr $3d^2_z$ orbitals near the Fermi level were predicted in DFT calculation (bottom left) and experimentally confirmed by ARPES study (bottom right). The spin channels of the mid-gap states can be switched by changing the substrate magnetization direction.

Y. Naruo et al., "Ferromagnetic metal conversion directly from two-dimensional nickel hydroxide", Nanotechnology 31 (2020) 435602.

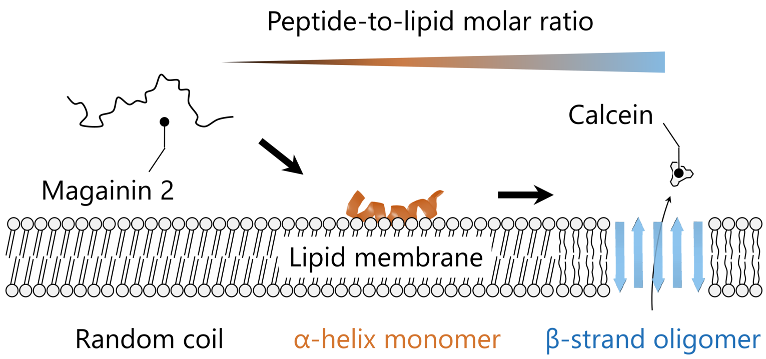


A direct metallic conversion from nickel hydroxide nanosheets to nickel metal nanostructures was founud through thermal annealing process in vacuum. The metal transition of the single-layer nanosheets (top) deposited on a Si substrate was revealed by XAS. The XAS signal (bottom left) significantly changed at annealing temperatures above 250 °C, where corresponding ferromagnetic XMCD signals (bottom right) emerged from nonmagnetic state of nickel hydroxide. Atomic force microscopy measurements indicate that diffusions of nickel atoms on the substrates leads to a structural change from a 2D-like structure to a particle-like structure.

1-4. Circular dichroism of biomaterials (BL-12)

M. Kumashiro et al., "Formation of beta-strand oligomers of antimicrobial peptide magainin 2 contributes to disruption of phospholipid membrane", Membranes, 12, 131 (2022).

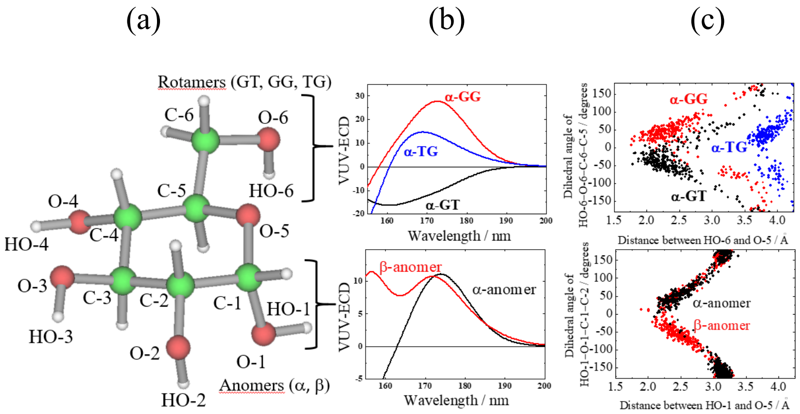
Antimicrobial peptides (AMPs) interact with and damage the cell membranes of antimicrobial-resistant microorganisms. To gain new insights into AMP design strategies, we characterized the membrane interaction mechanism of the model AMP, magainin 2 (M2) using synchrotron-radiation circular dichroism, linear dichroism, and fluorescence spectroscopies. The results showed that α-helix monomers of M2 assembled and transformed into β-strand oligomers with increasing peptide-to-lipid molar ratio, destabilizing the membrane structure. Our findings suggest thatthe formation of β-strand oligomers of M2 contributes to the disruption of the cell membrane.



Disruption process of lipid membrane by formations of β-strand oligomers and of α-helix monomer of Magainin 2

K. Matsuo and K. Gekko, "Vacuum ultraviolet electronic circular dichroism study of D-glucose in aqueous solution", Journal of Physical Chemistry A, 124, 642 (2020).

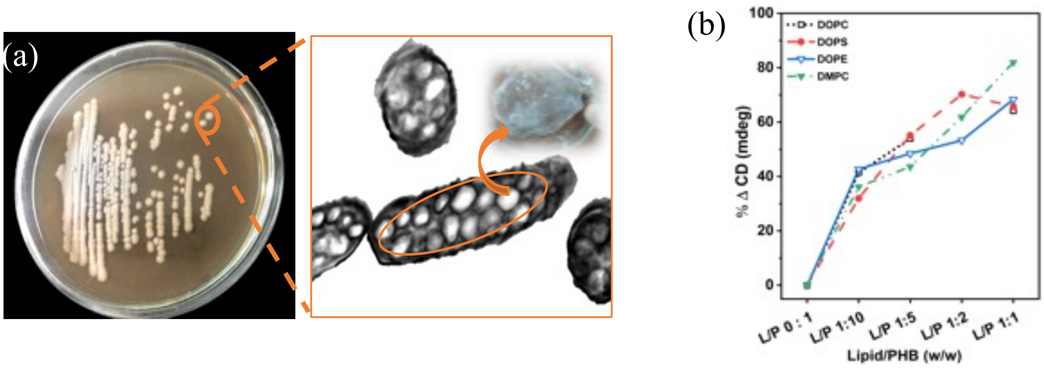
VUVCD exhibited unique spectra depending on the α-anomer and β-anomer configurations of the hydroxyl group at C-1, and the three gauche (G) and trans (T) rotamer conformations (GT, GG, and TG) of the hydroxymethyl group at C-5. These unique spectra could be ascribed to differences in the patterns of intramolecular hydrogen bonds around the hydroxymethyl group at C-5 for the three rotamers and around the hydroxyl group at C-1 for the two anomers. The strengths of these intramolecular interactions increased as the degree of hydration around the corresponding chromophores decreased, suggesting that hydration is a key factor for stabilizing rotamer and anomer structures.



(a) Chemical structure of D-glucose (b) Theoretical CD spectra of three rotamers of α-D-glucose and two anomers of D-glucose (c) Unique conformations and hydrogen network of each isomers.

M. E. Esmael, et al., "Lipid-membranes interaction, structural assessment, and sustainable production of polyhydroxyalkanoate by *Priestia filamentosa* AZU-A6 from sugarcane molasses", Int. J. Biol. Macromol., 242, 124721 (2023).

The study investigated the polyhydroxyalkanoate (PHA)-lipid interactions via circular dichroism (CD) spectroscopy and offered a sustainable PHA production approach employing a cost-effective microbial isolate, *Priestia filamentosa* AZU-A6. Characterization techniques including FTIR, NMR, GC-MS, DSC, and TGA techniques identified the biosynthesized PHA's as poly-3-hydroxybutyrate (PHB). On the other hand, CD observations suggested that chemistry of lipid molecules governs lipid-PHB interactions, potentially impacting PHB structuration.

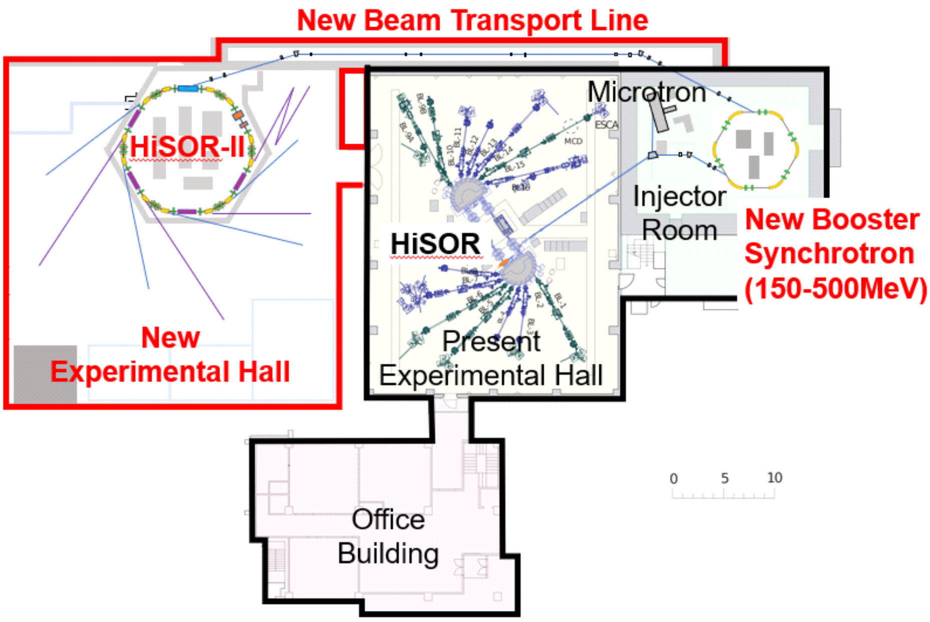


(a) Morphology of PHB pellets on cultivation plate and TEM produced by *P. filamentosa* AZU-A6; (b) PHB structuration affected by interacting with various lipid molecules using CD spectroscopy (DMPC:1,2-dimyristoyl-*sn*-glycero-3-phosphocholine, DOPS:1,2-dioleoyl-*sn*-glycero-3-phospho-L-serine; DOPC:1,2-dioleoyl-*sn*-glycero-3-phosphocholine, and DOPE: 1,2-dioleoyl-*sn*-glycero-3-phosphoethanolamine.

1-5. Light source accelerators and insertion devices

Design work on HiSOR-II

We decided the target parameters of HiSOR-II such that the emittance is around 10 nm and the electron energy 500 MeV. With these parameters, HiSOR-II will give almost diffraction limited VUV light whose brightness is larger by almost two orders of magnitudes than that of the present HiSOR. HiSOR-II will be operated in the top-up injection mode. We are considering several options to be able to respond flexibly to future changes in the circumstances surrounding the facility. The circumference of the ring may be between 30m and 50m. The injector may be a newly constructed full energy booster synchrotron or the re-use of the present HiSOR as the booster. Sustainability will be the key concept of HiSOR-II. The hardware developments, such as permanent/electric hybrid magnets or new beam injection scheme with pulsed multipole magnets are in progress as collaborating with KEK Photon Factory, UVSOR and Nagoya University.



Layout of HiSOR-II Accelerator system.

Developments and Improvements on the present HiSOR

We continue the efforts on improving the performance of the present HiSOR. An example is the improvements on the undulator control system. In the first step, we made it possible to control the undulators from the beamline control system. However, because the improvement was realized based on the present accelerator control system, the time response is not sufficiently high and the orbit correction is not sufficiently precise as requested from the users. We are preparing a totally new system which is separated from the accelerator control system but accessible both from the accelerator control system and the beamline ones.

The aging issue of the accelerator components becomes serious year by year. To avoid a long shutdown caused by a hardware trouble, we are systematically updating the components in a prioritized manner. Currently, we are developing a new pulse magnet power supply which will utilize semiconductor switching devices instead of thyratron.

Research Areas

1-1. Electronic structure analysis (BL-1, BL-9A, laser PES)

Current Status

Angle-resolved photoemission spectroscopy (ARPES) is the most direct and powerful tool to directly reveal the electronic states in solids, such as energy band dispersions, qusiparticle states, and Fermi surfaces. Since the initial stage of HiSOR, HiSOR has promoted high-resolution ARPES in the ultraviolet and soft-x-ray region at the undulator beamlines BL-9A ($h\nu$ = 6 - 40 eV) and BL-1 ($h\nu$ = 26 - 300 eV) and has been a world-leader in this field. In order to improve spatial resolution as well as energy and angular resolution, HiSOR introduced a laser beam with a spot size around 5 μm to a newly commissioned offline μ-Laser ARPES machine [H. Iwasawa *et al.*, Ultramicroscopy **182**, 85 (2017), 2023-17], which also rapidly became a world leader.

ARPES with low energy photons ($h\nu$ < ~10 eV) is especially critical for if one wishes to maximize the bulk sensitivity, energy-resolution, and momentum resolution of an ARPES experiment. Good examples are studies examining many-body effects [2022-19] and the fine structure of momentum dependence of superconducting gaps [2021-18] in cuprates, as well as detailed examination of the Rashba splitting in the surface state on Re(0001) [2023-4]. A wide range of higher photon energies are essential to investigate the k_z (i.e. bulk) dispersion of electronic bands and matrix element effects, and distinguish surface-derived states from bulk states. A combination of the two photon energy ranges (low and high) allows for detailed spectral analysis by using BL-1 and BL-9A.

These days, topological materials such as topological insulators and Dirac/Weyl semimetal have attracted great interest, and many photon-energy-dependent ARPES measurements have been performed at BL-1 to reveal the three-dimensional electronic structure of these materials. In these cases, flat cleaving surfaces were often smaller than the previous beam spot size on the sample [300 (H) μm × 200 (V) μm]. This in turn reduced the number of successful measurements on such systems due to the large number of cleaving attempts necessary to obtain a large enough surface, leading to a strong demand to reduce spot size on the sample.

In order to solve these problems, the HiSOR team has improved the spatial and energy resolutions. To decrease the beam size, they have installed ellipsoidal focusing mirrors (SIGRAY), successfully reduced the beam spot size down to 80(H) μm × 45(V) μm (50 μm x 30 μm is expected to be possible in the near term). In addition, they have motorized the operation of the MF mirror for fine tuning. Consequently, they have successfully demonstrated the spatial mapping on the sample allowing much easier operation and higher ARPES fidelity. In addition, they have installed two new electron-energy analyzers with angle-deflecting optics that enable θ_x - θ_y mapping at BL-1 (MBS A1) and BL-9A (SPECS ASTRAIOS 190 with wide detector angle). With these analyzers and beam focusing optics, they can fix the beam spot position on the sample and get Fermi surface mapping without moving the angles of the sample. These analyzers enable the users to obtain precise measurement with ~0.1 (deg) mapping. The energy resolution at BL-1 has reached around 4.5 meV at $h\nu$ = 25 eV and 60 eV which is extremely good performance. The manipulators are controlled by an in-house LabVIEW software with arbitrary choices of mapping dimensions [H. Iwasawa *et al.*, J. Synchrotron Rad. **24**, 836 (2017).]. Now, one can automatically perform ARPES mappings using arbitrary combinations of directions (polar, azimuth, tilt, x, y, z). In addition, the nano-stage has been installed on BL-1. By combination with the tens of micron-sized beam spot, it enables users to reproduce sample positions with the same ordered precision and perform detailed spatial mappings with high lateral resolution [2023-3].

As for BL-9A, using the ARPES system with variable polarized low energy photons ($h\nu$= 6-40 eV) provided by the APPLE-II undulator, users can investigate fine details of the electronic structure. Due to continued efforts to improve the beamline optics, and specifically the monochromator stability, photons with linewidths below 1 meV can be provided for energies below 10 eV [M. Arita *et al.*, Phys. Rev. B **77**, 205117 (2008)]. HiSOR staff have also successfully focused the beam on the sample surface around 600 μm (H) × 100 (V) μm, but in near future it is expected that the beam will be focused around 90 μm (H) × 40 (V) μm using capillary microfocus optics. In addition, to improve the spatial resolution, they have upgraded the low-temperature 6 axes manipulator of BL-9A. This is a fully motorized high precision 6-axes goniometer (temperature range: 12-370 K, azimuth angle rage: ±90˚, tilt angle range: -25˚ to +50˚) that enables the user to measure Fermi surface maps over a wide momentum range via tilt or azimuth rotations. They have also installed the new analyzer on BL-9A then one can fix the beam position on the sample and can do ARPES mapping without moving the orientation of the sample. The analyzer can be linked to an external PC for controlling external devices such as goniometer, enabling various automatic ARPES measurements. The high precision goniometer is also effective to measure band dispersions along high-symmetry lines for small Fermi surfaces located close to the Γ point of the surface Brillouin zone. Representative results obtained at BL-9A over the last 5 years include the elucidation of the mixing gap observed in the triple-layer cuprate superconductor, $Bi_2Sr_2Ca_2Cu_{10+\delta}$ [2021-18], the observation of two dimensional anisotropic Dirac cone in a monolayer boron sheet [2018-4], the observation of Rashba-like spin splitting $PtBi_2$ [2019-8], and the acceleration of a metal-insulator transition in topological semimetal nanofilms [2021-16].

To perform various advanced experiments at the beamlines, sample preparation and characterization are also important. They connected a preparation chamber for non-cleaving samples at BL-1 and BL-9A that can characterize samples using LEED and Auger electron spectroscopy. For sample preparation, Ar ion sputtering and annealing (direct current as well as electron bombardment) can be performed [2022-2, 3]. A newly designed preparation chamber manipulator head allows for annealing temperatures higher than 2000 K with room for additional flashing of the sample. In addition, depending on the user's requirements, it is possible to install evaporators and gas doser if needed. At BL-1, the preparation chamber is independent from the main transfer route allowing for the measurement of cleaving samples while more demanding sample preparation can take place in the preparation chamber.

Starting in 2014, they have developed and commissioned the stand-alone μ-Laser ARPES machine at HiSOR [#1]. Within the first year they were able to achieve ultimate energy resolution (260 μeV deconvolved at 7.2 K with 0.75 meV and 1.5 meV resolution as common user choices during experiments) and open to the user community. Focusing on achieving ultimate angle as well as spatial resolution they upgraded the manipulator stage ("nano-stage") and replaced pinhole apertures used for reducing the spot size with focusing optics. This allowed them to achieve ultimate angle (undetectable Gaussian broadening at Lorentzian FWHM of 0.0033 $Å^{-1}$ in Bi-2212) and spatial resolution at the same time. They have installed an optical monitoring system (spatial resolution ~14 μm) for sample position adjustments. Based on the results from the μ-Laser ARPES system, they have found the linewidths of ARPES spectra can be drastically improved depending on the measurement positions even for layered samples having a good cleavage plane and a seemingly well cleaved surface. In 2022, a joint research agreement was signed between HiSOR and QST (National Institute for Quantum Science and Technology), and the main chamber of μ-Laser ARPES was relocated to NanoTerasu, and the laser light source has been moved to BL-1.

So far, the μ-Laser ARPES system has been successfully used to investigate the evaluation of the electronic structure by doping an impurity into the antiferromagnetic material, $Mn_{1-x}Ge_xBi_2Te_4$ [2023-16], the observation of Dirac gap at the selected surface on the half-magnetic topological insulator with magnetization [2021-28], and other projects of topological materials with antiferromagnetism [2021-27, 29, 30, (16), 2022-13, 16, 19].

Evaluation

The rotation of the BL-1 main chamber around the light incidence allows for a unique setup where the degree of linear polarization remains at 100% all the time. Such a polarization dependent ARPES measurement enables users to disentangle multi-band system based on the dipole selection rule [2022-2]. Furthermore, this system has been proven useful to extract orbital textures by continuously rotating the incident electric-field vector with respect to the detection plane. The dramatically decreased beam spot size, new nano stage and new analyzer enables users to perform the most precise measurements. These developments also lead to save the measurement time, too.

The high-resolution variably polarized low-energy photons from the APPLE-II undulator at BL-9A, in combination with the available offline sources, provide an excellent environment to investigate fine details in the electronic structure near the Fermi level. The installation of the fully motorized 6-axes goniometer and the control software allows high-quality ARPES measurement in momentum space. In addition, the new analyzer with a wide detector angle (ultimately ±30 deg, presently operating at ±19 deg) enables users to cover significant ranges of k-space, which is more challenging at low photon-energy. The electrodes installed in the manipulator have been developed to do the operando measurement and this development leads to exciting opportunities for researchers from the field of application, such as devices.

The recently commissioned μ-Laser ARPES machine has proven to be a highly competitive setup and has gotten much attention from different groups inside and outside of Japan for its attractive combination of spatial, angular, and energy resolution.

Perspective

The experience gained from past and future upgrades of the three machines will be transferred to the beamlines of HiSOR-II. It is expected that orders of magnitude more efficient ARPES measurements and/or ARPES with improved spatial resolution of ~1 μm will be possible at the new synchrotron ring. At HiSOR-II, precise and detailed investigations of the electronic structure would be performed which are indispensable to further fundamental understanding of various transport and magnetic properties of solids.

Keeping in mind the current trend of community demands, as well as the future upgrade of the synchrotron radiation towards a low emittance source, it is important to focus on improvements shown below. To begin, based on the impressive results from the ARPES system of BL-1, it is of crucial importance to reduce the spot size from its current size, ~50 (H) μm × ~40 (V) μm, to at least below 20-30 μm to increase the surface selectivity as well as the angular resolution and maintain international competitiveness.

A future upgrade of such a deflector type analyzer to install a 3D VLEED-type spin detector should also be considered. This would lead to a unique endstation at BL-1, which enables users to perform various experiments in the high spatial and angular resolutions with the surface and k_z sensitive excitation energies, combined with the resolution of the spin (VLEED) and ultimate resolution of orbital textures. The latter is being possible by the rotatable analyzer system, which allows to keep 100% purity of polarization between *p*- and *s*-polarizations a feature setting apart BL-1 from other ARPES beamlines around the world.

At BL-9A the reduction of the beam spot-size is even more critical than at BL−1 since the present spot size at 9A is at present much worse and is far behind other beamlines around the worlds. A high magnification ellipsoidal mirror and spatial filter to the main chamber is the highest priority, which can reduce the beam size down to a more competitive scale of ~100 μm (H) × 40 μm (V). This upgrade will allow the measurements of smaller domain samples or rough cleaved 3-dimensional sample surfaces, though still not near the state-of-the-art. Another demand from many users is the addition of an automated photon energy control system that changes the monochromator and undulator gap automatically. This, together with the 6-axes goniometer, would allow users to map the 3-dimensional momentum space in a convenient fashion.

Finally, to advance the capabilities to measure at low temperatures with very high energy, angular, and spatial resolutions, it is necessary to improve the design of the manipulator to reduce the residual magnetic fields in the chamber and improve the thermal radiation shields to reduce mechanical vibrations. To that end a low-vibration coupling to the cryo-shield should be installed and crucial parts of the manipulator exchanged with non-magnetic materials. In addition, the suggested plan to standardize the design of the transferred sample holder (Omicron type) for photoemission beamlines (BL-1, 7, BL-9A, 9B) is strongly encouraged.

In the present status, the μ-Laser ARPES machine is highly competitive and allows to produce state-of-the-art results. To stay ahead, it is recommended to extend its capability to access ultra-low temperatures ($T \sim$ 2-3 K) in order to improve the energy resolution. One of the options is an installation of a low-vibration cryo-shieled in combination with a new manipulator. It has been shown that such a setup can achieve temperatures below 3 K while retaining the rotational degrees of freedom [M. Hoesch *et al*., Rev. Sci. Instrum. **88**, 013106 (2017)]. The laser source is now installed at BL-1, and the combination with the laser, synchrotron radiation, and the spin detector will open a new comprehensive study.

1-2. Spin structure analysis (BL-9B, laser spin-ARPES)

Current Status

This research division conducts research on quantum spin physical properties of materials by spin- and angle-resolved photoelectron spectroscopy. So far, the staff of HiSOR have developed and been improving spin- and angle-resolved photoemission spectroscopy (spin-resolved ARPES) endstation equipped with a very low energy electron diffraction (VLEED) type spin polarimeter. Since the efficiency of VLEED polarimeter is about 100 times higher than the conventional Mott spin detector, higher resolution measurement ($\Delta E \leq 10$

meV, $\Delta k = 1 \times 10^{-2}$ Å^{-1} @ hν = 21 eV) in shorter measurement time has been realized [T. Okuda *et al.*, Rev. Sci. Instrum. 87, 103302, (2011).]. By using two VLEED spin polarimeters, that were set orthogonally to each other, enable complete determination of three-dimensional spin vectors (S_x, S_y, S_z) [Okuda *et al.*, J. Electron Spectrosc. Relat. Phenom., 201 23 (2015).] Also, for accurate Fermi surface measurement, a high precision tunable temperature (~20 K-470 K) 6-axes goniometer is available. Recently, toward the spin-ARPES measurement in operando condition, the manipulator head was remodeled and the specially designed sample holder with multi-electrodes can be used now. In addition, for the experiment requiring very low temperature condition the other manipulator for low temperature measurement (~6 K) is also now available.

The endstation is located at one of the two undulator beamlines in HiSOR where any kinds of light polarization (left / right circular polarized / horizontal / vertical polarized) by the APPLE II type undulator is available. The available photon energy of the beamline is hν = 16 to 100 eV. (100-300 eV is also available but only for low energy resolution measurement) Although the beam size was relatively large, 3 mm (H) ×1 mm (V), new capillary type spheroidal mirror was installed in 2020 and the beam size is reduced about 1/10 [500 μm (H) × 100 μm (V)]. In addition, the x-y-z stage of the manipulator was also renewed to the high precision type with the positioning accuracy of about 1 μm.

To make experiments more user-friendly and convenient, the grating exchange and the change of the slits are motorized in 2023 as part of DX promotion that will be also helpful for the remote operating experiment from the outside of the facility.

In addition to the SR beamline BL-9B, a new spin-ARPES system using 6 eV Ti:S laser has been developed for the purposes of further expansion of collaborative research and the R&D of use of the 3rd generation light source in the future. Very high energy and momentum resolutions (ΔE~5.5 meV and Δk~0.009Å^{-1}) have been realized. By utilizing laser light, not only the improvement of energy and momentum resolution, but the small beam spot size can be realized which makes the research with micron size samples, samples with multiple domains and microscopic measurement are possible. As a result, microscopic measurements with ~5 μm spatial resolution are now available. For the ARPES measurement with high spatial resolution the electron analyzer with electron deflector (Scienta-Omicron DA-30) that enables to do Fermi surface mapping or angle resolved measurement without rotating samples, and the high precision x-y-z stage (~1μm) with encoder with cryogenic manipulator (~10 K) are installed at the laser-SARPES station. In addition to the high energy, momentum and spatial resolutions, variable polarization properties of laser light must be also useful to study detailed polarization dependence in spin-ARPES measurement.

In addition to these spin-ARPES endstations, a multi-channel spin detector that can improve the efficiency of spin-detection more than 1000 times higher than the present system is now under construction. Although the magnetic deflector was initially adopted in the design, it was remodeled to a simpler style without using the magnetic deflector. In order to accelerate the development, we hired a new assistant professor for this project in 2023. In parallel, we are exploring new target materials for the spin detector which make it possible to detect out-of-plane spin polarization in the multichannel spin detector. As a potential target material FeCo film on Rh(001) surface is studied recently and the performance test is now in progress.

Because of the high performance of the end-station about 157 proposals (about half (71) of them is from abroad) have been submitted in these 6 years and published 54 papers (13 Top 10 % or higher papers (24 % of total publications), 20 papers in high impact factor journals (37 % of total publications)). Some of the representative publications are follows.

The first experimental evidence of topological Kondo insulator on $SmB_6(111)$ surface [Nat. Commun. 10, 2298 (2019).30 citations], experimental evidence of the Weyl semimetal on the Heusler alloy Co_2MnGa [Commun. Mater. 1, 89 (2020). Top 7% papers, 50 citations], the first experimental evidence of hedge hog spin texture of chiral crystal Te, [Phys. Rev. Lett. 124, 136404 (2020). Top 3% papers, 73 citations], the investigation of the surface state of $MnBi_2Te_4$ [Phys. Rev. X 10, 031013 (2020). 4% 71 citations] and so on (1 Top 1%, 1 Top 5% and 2 top 6% papers).

Evaluation

Equipped with a very-low-energy-electron-diffraction (VLEED) spin detector, that was developed in-house with an order-of-magnitude-higher efficiency than a conventional high-energy Mott spin detector, and elliptically-polarized undulator synchrotron radiation in a very efficient photon energy range, HiSOR has been one of the most active and competitive centers for spin-resolved ARPES (S-ARPES) research in the world. Its high-level activity has been well proved by the excellent publications during the last decade, which have made important contributions to the progress of the research on topological materials and 2D materials with an active spin degree of freedom.

In his talk Dr. Miyamoto gave a status report of this facility. The VLEED spin-resolved ARPES system has demonstrated an energy resolution of $\Delta E \leq 10$ meV, an angular resolution of 0.4° and the capability of 3D spin vector analysis, which are among the highest resolutions reached in spin-resolved ARPES in the world and enables precise spin-resolved measurements that require high energy and angular resolutions.

The versatile sample facilities permit the preparation of a variety of samples efficiently, which was updated with in-operando measurements and lower temperature measurements down to 6 K.

The system was further upgraded by reducing the beam size on the spot by 1/10 (500-micron scale) with a capillary mirror and equipped with high-precision x-y-z sample motion. This will be important for various exfoliated 2D materials and in-operando measurements.

The IRC also heard about the construction of an extra off-line spin-ARPES system using 6-eV laser, which provide higher energy and momentum resolution in a different photon energy range. This system can provide a much higher spatial resolution of 5 micron. The IRC agree that this system is a powerful complement to the existing spin-ARPES beamline facility in various ways.

The IRC is impressed by the continued upgrade of the system and the continued production of high-level research results and publication by the internal group, domestic users and international users.

The IRC also find that the on-going development of the VLEED spin detector system utilizing multi-channel spin detector would be another important contribution of HiSOR to the world community when it is successfully constructed.

The scientific highlights of spin-ARPES beamline are impressive and competitive, covering updated topics such as ferromagnetic Weyl semimetals and chiral crystals. However, since the overall research activity for finding new topological materials is gradually shrinking world wide, a long-term strategy for spin-ARPES activity has to be reconsidered for the next phase.

Perspective

The recent boom in spintronics and topological insulators research is raising demands for spin-resolved ARPES measurements. Given the global scarcity of spin-resolved ARPES instruments in operation, HiSOR can help to meet the demand by operating both systems, i.e. systems at SR beamline and with a laser source, in its possession, and thus play a prominent role in this research field. The demand is especially high for spin-resolved ARPES measurements using high-brilliance energy tunable synchrotron radiation sources. Since the spin-polarized states on topological insulators are surface states, one can in principle observe the states with any photon energies. However, the spin-polarized states of Weyl semimetals, altermagnets etc. are located at the specific area in the 3D k-space. Therefore, not only high energy and angular resolutions but the possibility to tune the photon energy is crucial. Thus, although the new laser spin-ARPES system must be helpful the use of synchrotron radiation is essential if the characteristics of the high-resolution spin-ARPES systems are to be exploited to the fullest extent. Currently, companies like VG Scienta and SPECS are bringing commercial instruments on the market, but the development of the VLEED type spin detector and also multichannel spin detector at HiSOR will keep this facility ahead of the field.

Staff at HiSOR have long-term experience with designing and operating spin-resolved photoemission experiments, the institution is thus in an excellent position to develop a "multichannel spin detector”. This would represent one of the world's most ingenious measurement systems for spin-resolved ARPES to dramatically enhance the energy and angle resolution, and potentially to introduce the possibility of ultrafast temporal resolution.

It is strongly desired that HiSOR engages in all these efforts in the future to enhance its capabilities and create the world’s finest environment for the most advanced spin-resolved ARPES experiments, make synchrotron radiation available at any time, and provide a stable supply of user beam time. However, ultimately, the 28-year-old synchrotron radiation source itself must be upgraded in the near future. In addition to the problem of the shortage of beam time, it is desirable to be able to use a more focused, high-quality synchrotron radiation beam in order to fully utilize the world's highest-level spin ARPES technology cultivated at HiSOR.

1-3. Nanomaterial analysis (BL-14)

Current Status

The beamline BL-14 has been utilized for several types of absorption spectroscopy experiments in a soft X-ray region between 400 and 1200eV, including the main technique of soft X-ray magnetic circular dichroism (XMCD) measurements. The targets of the XMCD experiments are magnetic nanostructured materials grown on kinds of substrates, whose samples are fabricated by epitaxial method. The XMCD experimental system consists of an XMCD measurement chamber and a suite of interconnected UHV chambers for the in-situ sample fabrication and analyses (LEED, AES, STM). In the sample fabrication, magnetic ultrathin films and multilayers are monoatomically grown with sub-monolayer precision, using real-time RHEED oscillation monitoring. Fabricated magnetic nanostructures are quickly transferred into the measurement chamber in the beamline, and their native magnetic properties are investigated without influence of oxidation or surface pollution. The XMCD measurements are carried out with circularly polarized component ($P_c = 0.7$) of SR beams in total electron method, where a set of permanent magnets (1.1 T) and an electromagnet (0.3 T) are available for magnetizing samples, and the temperature range is between liquid nitrogen and room temperature.

Recently, the group members of BL-14 have started development of a soft X-ray reflectometer that is compatible with low vacuum or He atmospheric environment, aims at magnetic and structural evaluation for practical multilayers and films. Assembling of the reflectometer and control tests of a motorized θ-2θ goniometer have been finished. Successful installation of the apparatus to BL-14 has been achieved with good compatibility between vacuum separation and influx of soft X-ray from UHV beamline, by utilizing silicon nitride membrane.

Another upgrade project under development is a compact sample fabrication system that has portability among beamlines in HiSOR facility. The movable system is expected to enhance joint projects with multiple experimental methods across the beamlines, changing the current situation that only XAS/XMCD is available for nanomaterial samples fabricated locally at BL-14.

The members of BL-14 have also made a strong effort at computational method aids material studies at SR beamlines. Successful work on spintronic interfaces was achieved based on combination study between beamline experiments and first-principle electronic structure calculations for ultrathin magnetic multilayers. At present, they are trying computational analysis on interlayer magnetic interaction observed in ultrathin structures of ferromagnetic tunnel junction.

Evaluation

The status and performance of the soft x-ray bending magnet beamline BL14 and the XMCD endstation has been presented at HISOR symposium. The talk by Dr. Masahiro Sawada talk (BL14 staff), and the additional user presentation by Dr. Naoyuki Maejima (from Rikkyo University and Institute of Molecular Science presentation) highlighted the use of XAS and XMCD approaches on the investigation of hybrid 2D/FM interfaces and NixP/Fe2P bilayers, evidencing excellent performance and the capability to complete cutting edge nanomagnetism studies. In the light of the publication and proposal record provided over the last 5 years (2018-2023), the beamline and XMCD endstation have sucesfully accomplished remarkable results over the the period, with around 10-15 manuscripts in good quality peer review journals (plus some recent excellent results pending publication in judgment of the results shown in the 28th HiSOR meeting).

Taking into account the limited operation of the facility and of the endstation (around 5 experiments per year), the covid shutdown and the very limited staffing (essentially one permanent scientist, Dr. Masahiro Sawada, and intermittently one young researcher PhD or postdoc), the results achieved and their quality deserve compliments. The provided documentation also demonstrates the endstation has provided service to a broad internal and external community, including various researchers and young studends at Hiroshima University; external users in Japan (CEMS/Riken center, Ritsumeikan University, Rikkyo University, Kumamoto

University), and overseas research institutions like IOFFE institute in Russia, or the Indian Institute of Technology in India.

Besides, a novel endstation for soft x-ray reflectometry is under installation and appears to be large progress and almost ready for commissioning (no measurements were yet shown). This effort is commendable and well received: such an instrument enables complementary approaches to the XAS, XMCD techniques and broadens the beamline usage, offering novel opportunities and widens the portfolio of techniques at the service of the HiSOR community. Additionally, work has been done in setting-up a MBE portable set-up that can be docked at various endstations at HiSOR facility. Again, this is remarkable work and should open novel opportunities for studies at for example ARPES instruments, and/or multimodal studies combining x-ray experiments at more than one instrument, in example XMCD and ARPES.

Looking back at the recommendations already made by the International Review Committee back in 2018 (see related 2018 report), one finds: i) extension of the cryogenic temperatures below liquid nitrogen (i.e. liquid Helium); ii) implementation of a larger (high) field magnet, either a superconducting magnet or a high field magnet; iii) addition of a fluorescence sensor for measurements on insulating samples. Such recommendations still apply now in 2024, and will be the highest priority recommendations. Taking into account eventual budget limitations and the present situation with liquid Helium (unless HiSOR has a secured liquid Helium supply), we refine in the following those recommendations, to hopefully increase the likelihood that some of them could actually happen within the next upgrade. Furthermore, in an investment is done onto a higher performance synchrotron source, this would only make sense if this is leveraged with corresponding enhanced endstations, in particular the XMCD endstation, but also possibly the reflectometry endstation.

Regarding working at liquid Helium temperatures, i.e. 4 Kelvin, cryogen-free solutions have evolved notably in the last years and have a cost that can be quickly recovered from savings in liquid Helium, whose price (in Europe at least) has increased by a factor of ×3 or more, and where not only the price but just having a guaranteed supply is a problem. Among those solutions, two types might be worth evaluating: a) cold gas recirculation solutions (such as the *stinger* solution from Coldedge company), in which a close cycle circulation of Helium gas goes through a cryocooler head (typically a GM type with significant vibration and a 4K stage), and then compressed to high pressure and circulated through a kind of helium transfer line onto the cryostat coldfinger, and then is collected by an outer shield on the line back to the compressor for heat dissipation. Such a solution might have a vibration signature, but the transfer line makes for some decoupling; b) a recondensing setup (for example those offered by Janis company, now Lakeshore), where liquid Helium is used but the gas coming out of the cryostat go onto a Dewar recipient equipped with cryocooler heads in order to recondense the gas back to liquid). Such system might present less vibration issues. Such cryocooler systems (typically Sumitomo) have a 14,000 to 20,000 hours maintenance and besides electricity cost are very robust and efficient.

In what respect to enhancing magnetic field capabilities, there are some relevant remarks that appear relevant to complete previous suggestions: presently BL14 is a bending magnet and has not implemented a capability to switch the x-ray polarization. This is very important to keep on mind. This is “solved” because a relatively fast switching of the magnetic field (0.3T) in few seconds (5secs) is possible with the current electromagnet.

With this in mind, is clear that a high field SC electromagnet, with typically say 6T and a 2T/min ramp (as such used nowadays at XMCD beamlines in ALBA, Diamond, SLS or Soleil) will make XMCD very inefficient. However, an electromagnet with an extremely fast ramp seems advantageous: a 2T electromagnet feed by a 200 Amps/s or 400 Amps/s power supply can switch magnetic field in 1 to 2 seconds. This would match a XAS, XMCD measurement in which because the low flux of the bending magnet, one is integrating a few seconds per point at a given photon energy, switching the field, then measuring the next energy, and so on, i.e. measuring spectra on a "step by step" motion with field switching at every step. Such an electromagnet and power supply may range on the 100,000 USD range (see for example GMW company solutions, Lakeshore or Caylar solutions), and would be very similar but significantly higher performance than the current electromagnet.

Still, considering options for polarization switching is worthy. It is maybe interesting to mention that in various facilities (ALS, ALBA, maybe others) there are test exploring the possibility to insert special devices to change the trajectories of the electron beam in order to obtain very fast modulation of the x-ray polarization at a bending magnet. A more classical approach used in various full field soft x-ray transmission microscopes (ALS, ALBA) is to have a movable slit on the source to select photons emitted above or below the dipole plane to have positive or negative x-ray helicities; an equivalent but different solution is implemented in BESSY where a mirror is moved in order to let photons emitted above or below plane to pass through a slit downstream. In the event of an upgrade of the machine, the possibility for the XMCD endstation to be placed at an undulator should be considered.

Now regarding the recommendation of a fluorescence detector, is worth discussing briefly some of the options: a good an inexpensive option is a photodiode (could be a Si or GaAsP photodiode with relatively good radiation resistance and low dark current, and a good area) or avalanche photodiode or a channeltron, which should be placed as close as possible to the sample. Simple and low-cost diodes from Hamamatsu work reasonably well (a thin foil to avoid electrons might be take into consideration). A more fancy and costly option is a Silicon drift detector (Rayspec, Vortex, others) which will enable partial fluorescence yield as it has a certain energy resolution (around 125 eVs).

Besides that, there are other detection schemes that do not seem implemented and maybe equally or even better than fluorescence when possible: transmission and x-ray excited luminescence (which is essentially a transmission like approach). A simple diode collecting transmitted light, or the optical light excited by x-rays on luminescent substrates (sapphire, MgO, …many other oxide substrates) enable detection modes that are bulk sensitive (hence complementary to TEY), and that address the issues of insulating samples with fluctuating backgrounds or operando experiments with applied currents or voltages where leakage onto the TEY detection introduces noise.

It is too early to provide recommendations on the soft x-ray reflectometry endstation, but addition for a 2D detector (CCD, sCMOS) enabling off-plane resonant scattering (transmission, gisaxs, but in soft x ray range even grazing angle is not so relevant or interesting) is worth start thinking about. This would become even more relevant if HiSOR is updated to a synchrotron source with enhanced coherence.

A last advice if HiSOR wants to increase the productivity of the beamline and XMCD endstation, which will be even more relevant in the context of an eventual machine upgrade is to increase beamline staff, and balance properly faster turnover experiments with more complex experiments. If internal budget does not allow, this should be explored by fostering participation of scientist on national research grants as PI, in collaboration with other researchers, in order to have shared PhDs and postdocs. This if properly articulated, could and should be a career step forward for the beamline scientist. In this context, 2D materials could be a strategic opportunity for XAS, XMCD studies: the ARPES instruments are already working on bidimensional materials at the forefront of research in van der Waals and magnetic topological, Dirac materials, so an enhanced XMCD endstation could proof very interesting and complementary to the relevant on-going ARPES work. This could help boost the impact factor of BL14 publications as well. A beamline attached or moveable glove box, to allow experiments in air sensitive few layer vdW materials (bulk materials can be cleaved in-situ) might be also worth considering, either at the level of BL14 or movable between HiSOR instruments.

The beamline upgrades should take into account the possibility of an updated HiSOR machine, so any significant investment of money and resources is also useful and well adapted to such eventual novel scenario and the corresponding beamline or endstations conditions (which may differ from present).

Perspective

The concept to build end-stations at SR beamlines to achieve sample synthesis and fine analysis simultaneously, is one of the important ideas for material science, which is followed by the continuous efforts at BL-14 in the limited research field of magnetic nanostructures. The specialized studies should be continued if they are aimed at technological applications or something scientifically significant. However, efforts to exploit potential needs are also important, even if the old beamline has several limitations of beam quality. Wide range control of experimental conditions corresponds to broaden scientific scope, easy-to-use environment for users apart from SR community, and diversification strategy are recommended. Expansion of temperature and magnetic field range may be a pressing issue for the XMCD system, and user-friendly measurement with automatization may be effective for SR beginners. Advancement of multiple uses of soft X-ray beam at BL-14 and multiple measurements beyond the beamline should steadily be considered positively.

1-4. Circular dichroism of biomaterials (BL-12)

Current status

Circular dichroism (CD) spectroscopy is capable of measuring the difference in absorption of left- and right-circularly polarized light, making it a valuable tool for analyzing the structural characteristics of molecules such as natural products, proteins, polysaccharides, and nucleic acids. By combining CD data with other experimental and theoretical techniques, a more comprehensive understanding of structures, properties, and functions of molecules can be achieved. However, the conventional CD is limited to the far-UV and near-UV regions, restricting its usefulness. The vacuum-ultraviolet (VUV) region, which extends below 190 nm, can be more sensitivity covered when using a synchrotron radiation (SR) as a high intense light source. Hence, the utilization of SR light source has enhanced the usefulness of CD spectroscopy by extending the wavelength region of CD the spectrum into the VUV region and enabling precise CD measurements. This advancement has allowed researchers to uncover new and detailed structural insights, such as the steric structures of large biomolecules like proteins and polysaccharides, and the absolute configuration of natural products with high-energy chromophores such as hydroxy group, acetal bond, and allene moiety.

VUVCD is particularly effective in determining the secondary structure of biomolecules, such as α-helices and β-strands in proteins. It is well-suited for various types of biomolecules with high molecular weight, temperature-dependent studies, and studies in different solvent conditions, including those involving membranes. Therefore, it can be used in conjunction with other structural biology techniques such as X-ray crystallography, small angle X-ray scattering, and NMR spectroscopy.

In 1997, a vacuum-ultraviolet circular dichroism (VUVCD) spectrophotometer was constructed at BL-15 at the Hiroshima Synchrotron Radiation Center (HiSOR) using a small-scale SR source (0.7 GeV). This spectrophotometer enabled the measurement of CD spectra in the range of 310-140 nm and has been successfully applied in the structural analyses of various biomolecules. Subsequently, the spectrophotometer was relocated to BL-12 with a Wadsworth normal incident monochromator, providing a photon flux of photons/sec, thereby enhancing the precision and speed of CD measurements.

Through continuous upgrades in measurement and analytical techniques, as well as collaborative research efforts with scientists worldwide, HiSOR has played a pivotal in VUVCD-based structural analyses of biomolecules. Internationally, VUVCD or SRCD beamlines are operated in notable SR facilities such as the Aarhus Storage Ring (ISA) in Denmark, Diamond Light Source in the United Kingdom, Brazilian Synchrotron Light Laboratory (LNLS) in Brazil, and Synchrotron SOLEIL in France.

The HiSOR VUVCD spectrophotometer utilizes an optical system, consisting of a combination of polarizer and photo-elastic modulator to generate left- and right-circular polarization at 50 kHz, a detection system with two photomultipliers, and signal processing system with a lock-in amplifier. A variable temperature system, equipped with a peltier element, enables the measurement of CD spectra of biomolecules within the temperature range of -20 to 100°C with an accuracy of ±0.1°C. This temperature control system underwent upgrades based on feedback from international committee reviewers of HiSOR which was held in March 2018.

Additionally, a Schwarzschild focus mirror was installed to reduce the size of the SR light, enabling a significant reduction in sample volume for measurements. This enhancement facilities the analysis of rare samples, such as proteins from human cells. The focusing system was further extended to high throughput measurements using a multiplate optical cell, which can accommodate 16 different samples simultaneously.

Another significant upgrade was the development of a time-resolved measurement (TR) system, employing a microfluidic mixing device dedicated in the dynamic observation of protein structures during membrane interaction. This device, integrated into the VUVCD instrument, allows for the determination of kinetic parameters and identification of intermediates in membrane interaction processes involving membrane-bound proteins. The TR technology developed serves as a convenient tool for obtaining various dynamic parameters related to the dependence of lipid / protein ratio, types of bio-membranes, temperature, and pH, which are crucial for elucidating the expression mechanism of biological functions of various membrane-bound proteins.

Furthermore, efforts are underway to develop a vertical CD device with microscopic functions to enable structural research of biomolecules in solid and semi-solid states. SR light is directed vertically by the MgF_2 coated Al mirror set up between the VUVCD instrument and BL-12, where it is converted into left- and right-circularly polarized light by a combination of polarizer and photo-elastic modulator. The modulated light passes through the sample after the condensing lens, and reaches the detector. By controlling the sample position with an automatic XY stage, microscopic CD measurements become feasible. Presently, this vertical CD instrument is applicable only to samples in the liquid state, but system for measuring solid and semi-solid states is under construction.

Evaluation

BL-12 represented by Dr. Koichi Matsuo has been and still is proof of a well functioning beamline. The field of interest includes the biophysical and structural biology. BL-12 offers a continuous operation during the working hours, allowing circular (CD) and linear (LD) dichroism as well as absorption spectroscopy. The vacuum-ultraviolet (VUV) CD spectrophotometer at BL-12 extends the CD spectra to the VUV region down to 170 nm for aqueous solutions and to 140nm for films. Low noise, low sample consumption (microliter range) and quick data acquisition provide structural information, which is unattainable with conventional CD instruments. Applications include membrane proteins, saccharides, nucleotides and disordered protein structure analysis, as well as protein-protein interactions, protein-nucleotide interactions and protein lipid interactions. Other activities of great value complementing these spectroscopic measurements are principal component analysis, neural networks, molecular dynamics and bioinformatics. (Peer reviewed publications and citation numbers, are proof of reliability)

The group of Dr. K. Matsuo has been joined by a Dr. Mohamed Ibrahim (assistant professor), who has been a real asset considering that he has already published! Also, like previously (2018) stated, the recruitment and of new beamline-staff increases the possibilities for exploring the beamline as well as accommodating and helping users and recruiting students more efficiently. I have been impressed by the present output 17 papers and usage of the VUV-CD. Keeping in mind that there has certainly been an interruption during the COVID pandemic and its restrictions.

Developments in place such as the vertical acquisition dispositive including a Schwartzschild focusing lens, microfluidic devices controlling the protein membrane dynamics (time resolved), as well as multi well plate reading and last but not least a Cuette flow cell for analysis of macromolecular orientation within liquid samples are new methodologies and devices, which add up to the existing equipment such as the sublimation chamber, for thin film preparations of organic chiral molecules, and microfluidic continuous flow and stopped flow set-ups. Also the installation of an IR spectrometer in the laboratory using the attenuated total reflection (ATR) and Fourier transform infrared (FTIR) spectroscopy as sampling techniques, allows investigations of samples in either solid or liquid state which are spectroscopies very much complementary to the VUVCD.

The installation of an automated temperature stepping mode (-20°C to 100°C) for CD and absorption spectroscopy is now in place and allows access to thermodynamics and thermal-stabilities assays of biological macromolecules in solution. Further developments which have been discussed with the beamline staff include the development and implementation of a dedicated linear dichroism.

The latest addition of the ChiroPoly Probe system for real-time monitoring of CD signals from free radical polymerisation processes will be a great asset also to attract scientist from chemistry backgrounds in addition to life scientists.

The committee strongly supports the investigations into these novel developments to pave the way for a new HISOR light source. VUVCD will be an essential part of the new beamlines in the potential upgrade to HISOR-II and I strongly encourage the management to sustain financial support as well as keeping and maintaining the staff of one beamline manager one beamline scientist and one post-doc in addition to 2-3 PhD students. I would also like to recommend the application to a higher funding body in Europe and Japan to support international exchanges with other CD beamlines in Europe (ISA, DIAMOND, SOLEIL) and the novel LNLS in Brasil. Exchange of students, validation of procedures for calibration as well as scientific exploits, such as the construction of an international reference dataset for biomacromolecules should be covered by a solid long-term grant.

In a conclusion, important improvements over the past 6 years have been made. BL-12 remains and is a very productive tool for structural biology, glyco-biology and in a more general way for chrial macro-molecular studies where other techniques fail due to size of the molecules or their complicated flexible.

Perspective

The HiSOR VUVCD has contributed significantly to the structural analysis of biomolecules and implemented a unique experimental and computational system, resulting in an increase in the usage of external users. To sustain the attractiveness of this unique instrument in the chiral research fields, ongoing enhancements to the existing instrument are crucial, and continuous efforts should be dedicated to the advancement of a next-generation VUVCD device.

At HiSOR-VUVCD, three projects are currently underway. Firstly, there an ongoing project to improve vertical CD spectroscopy, enabling the structural analysis of biomolecules in solid and semi-solid samples. Secondly, there is the development of a new beamline which dedicated to measurement linear dichroism spectra of oriented biomolecules using the Couette flow cell, which is suitable for small sample volumes. Thirdly, there is the development of a new ChiroPoly Probe system for real-time monitoring of free radical polymerization using VUVCD technology. Meanwhile, dedicated staff are indispensable for user support, equipment improvement, and outreach activities, ensuring a stable operating environment.

The VUVCD beamline holds significant value for both the HiSOR and life sciences communities, playing a crucial role in fulfilling the objectives of the "Joint Usage/Research Center" and facilitating structural analyses of biomolecules. Plans for continuous improvements to the existing beamline and the development of a next-generation VUVCD instrument are essential for meeting the important requests of domestic and international users, thus maintaining a pivotal role in the life sciences at HiSOR.

1-5. Light source accelerators and insertion devices

Current Status

The light source accelerator system at the Hiroshima Synchrotron Radiation Center (HSRC) consists of a 150 MeV injector microtron, a beam transport line, and a racetrack type storage ring. This system is called HiSOR (Hiroshima Synchrotron Orbital Radiation). The circumference of this ring is 22 m, and the bending radius is 0.87 m in the normal conducting bending magnet with high magnetic field of 2.7 T. Stored electron beam energy is 700 MeV, and synchrotron radiation having the critical energy of 873 eV from two 180-degree bending magnets can be extracted through 14 photon beam ports. There are two straight sections in the ring and two undulators are installed there. One is a linear undulator (2.4 m long, 57 mm period). Another is the variable polarization undulator (1.8 m long, 78 mm period). They provide high brightness VUV radiation to the photoelectron spectroscopy beamlines.

HiSOR has been successfully operated since 1996. Operation hours exceed 2,000 hours in each year, and users' operation hours are about 1,600 hours. The machine is running 11 hours a day (with 2 injections) and 4 days a week. Monday is reserved for machine tunings, machine studies and maintenances. The machine startup in the morning takes 30 minutes. It is almost possible to make a turn-key operation for normal use. The beam is about 350 mA just after the energy ramping and about almost a half just before the re-injection. Although the 24-hour operation has been requested from users, it is difficult to realize it due to the lack of manpower.

During the previous evaluation in the early 2010s, we reported a significant issue regarding the leakage of cooling water from the synchrotron radiation absorbers into the ultra-high vacuum chamber in the dipole magnets. Unfortunately, this issue has recurred this year, approximately 10 years later. The absorber was temporally repaired to recover the accelerator as soon as possible. It should be replaced with new one, whose mechanical design would be reconsidered, in the nearest future.

We evaluated the necessity and urgency of the aging-related issues of the accelerator components, and are replacing those one by one. We are currently promoting the replacement of the pulsed electromagnet power supply for beam injection, which would utilize semiconductor devises instead of a cyclotron for the switching element. The replacement would be in the summer of 2025.

The control systems of the undulators are being upgraded. In FY2023, it was improved within the existing accelerator control system framework, so that they could be controlled from the beamline control system. However, the response speed is not sufficiently high as requested by the users. In addition, the accuracy of the closed orbit correction is not sufficiently high and the experiments in the other beamlines are perturbed. To address these issues, we are going to install a totally new control system which is equivalent to that used in UVSOR.

Since the upgrade of the present HiSOR storage ring is not realistic because it is designed so compact and has no redundancy to introduce new ideas or apparatus. Therefore, for the future plan, a new storage ring HiSOR-II has been designed. We are preparing several plans to flexibly adapt to the situations of the synchrotron radiation science in our country and also of Hiroshima university. The beam energy of HiSOR-II would be 500 MeV, which is appropriate to produce high brightness VUV radiation with a compact ring.

We have designed a ring with a circumference of approximately 50 m but also are designing a more compact one with a circumference below 40 m. Although construction of a full energy injector is included in the plan, we are also considering usage of the current HiSOR storage ring as a full-energy injector for HiSOR-II.

To prepare for future plans, we are conducting researches on new accelerator technologies, such as new injection scheme using pulse multipole magnets, accelerator control by machine learning and permanent-electric hybrid magnets. These development researches are being conducted in collaboration with KEK-PF, UVSOR, and Nagoya University. This year, the accelerator groups of KEK-PF, UVSOR, Nagoya University and HiSOR have initiated regular monthly information exchange meetings. The collaboration aims not only to advance joint developments of new technologies but also standardization of accelerator components and maintenance parts, all of which would be effective in the reductions of the cost and the manpower for operating and maintaining the present machine and for developing the future accelerators. HiSOR-II would be almost diffraction-limited VUV source. We continue researches on developing new light source technologies in collaboration with UVSOR. Graduate and undergraduate students join some of these development studies described above. A few of them are conducted under the support of KEK's Accelerator Science International Education Program (IINAS-NX).

Evaluation

The IRC (International Review Committee) is impressed by the performance of the HiSOR light source despite its age of 28 years and being operated by a very small accelerator group. Pursuing aging-related issues with high priority and updating the control system are measures which are highly appreciated. Replacement of the presently leaking copper absorber should also be considered for the other dipole as a preventive measure.

The Director of HiSOR explained future storage ring options with a circumference ranging from 40 to 50 m for a diffraction-limited new facility HiSOR-II with six straight sections. The IRC fully agrees that technical improvement of this already very optimized machine is hardly possible and stable operation is becoming more and more difficult, while the research opportunities in physics, chemistry and biology offered by HiSOR are indispensable. Given the time scale for designing, constructing and commissioning a new light source, the IRC strongly recommends that the Hiroshima University decides on future plans for HiSOR as soon as possible and forwards them to the MEXT level.

With the experience of Prof. Katoh and the collaboration with other institutes like KEK, UVSOR and Nagoya University, the design of a new machine is in very good hands. Novel and sustainable technologies like the use of multipole magnets for injection and permanent magnets for the storage ring are under evaluation. Furthermore, the use of superbends (i.e., superconducting magnets instead of conventional storage ring dipoles) is considered to reach shorter wavelengths. As cost-effective alternative, the use of short bending magnets like those, e.g., at the ESRF-EBS storage ring may be evaluated.

To be competitive with other modern facilities, full-energy injection with top-up operation is mandatory. Instead of a new booster synchrotron, the use of the present storage ring as full-energy injector is being considered. While this is a cost-effective option, it would exclude the possibility of using both facilities simultaneously. Also, the integration of extraction kicker elements may not be trivial and the ramping time would be longer than for an optimized new synchrotron.

Generally, while keeping the budget for construction and operation of a new facility within reasonable limits, the design should be based on user demands and scientific output in order to obtain maybe not the least expensive but an economically optimized solution.

A two-step approach may be considered, (i) investment in a full-energy booster synchrotron for the present and future machine and (ii) funding of a new storage ring. A full-energy booster would shorten the injection time and enable top-up injection, very much favored by the users and adding to thermal stability of the machine. Technical challenges like the present 90-degree bend, which is not suitable for full-energy injection, should be investigated. Optimizing the injection efficiency and keeping the radiation background low during injection would be useful R&D in view of a future storage ring.

Investment in HiSOR-II pays best when that machine is used to full capacity. The present operation time of 1600 hours per year for users may suggest that the demand for such a light source is not very high. In order to avoid such an impression and as requested by the users, HiSOR should make an effort to operate for more hours. The IRC understands that operation time is limited by manpower, but (i) after a last injection in the evening, the machine could be left unattended and/or (ii) the machine could be operated by students with appropriate training, and/or (iii) R&D in automated operation without compromising safety standards should be pursued. These are options that have been successfully practiced at other light sources. Training students as operators has the positive side-effect that more students get interested in master/doctoral work at HiSOR.

If not already the case, HiSOR may apply for a graduate school or some other collaborative research program. In addition to funding of PhD positions and scientific progress, such an activity is prestigious, increases the visibility of the laboratory, and may be advantageous in view of applying for a new facility.

Not only the beamlines but also the accelerator physics group would profit from additional manpower, particularly when preparing a Conceptual Design Report to apply for a new machine. A sound concept for such a machine requires detailed simulations including nonlinear effects and a professional technical layout of accelerator components. The IRC recommends funding for one additional accelerator physicist and at least one more engineer or technician.

Perspective

Concerning the present HiSOR accelerator system, the drastic improvement of the specification is difficult owing to its structure. On the other hand, it is expected to keep the present performance as replacing the aged components systematically. It is even expected to improve the performances such as orbit stabilities or smooth undulator control from beamlines. However, to realize this, the employment of young technical staffs is desired strongly.

About the future plan, new technologies toward sustainability should be introduced. The collaborative R&D’s with other facilities is effective and strongly recommended. To realize this, it seems important to promote personal exchanges among the facilities, including engineers. At the phase of making a detailed design, the procedures for the daily maintenance and the long-term operation must be considered.

Appendix

Number of students who earned master's and doctoral degrees using HiSOR

Year	Master degree	Doctoral degree (user from abroad)
2017	5	3 (3)
2018	7	3 (3)
2019	7	5 (4)
2020	5	4 (3)
2021	7	5 (5)
2022	8	7 (4)
2023	11	6 (3)
Total	50	33

Publication List (2017-2023)

**In the list, papers in italics are those that used multiple beamlines and have already been listed on other beamlines.*

2017

BL-1

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BL-9A

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List of proposals

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17AG001 Satoshi Asaoka : Kobe University Research Center for Inland Seas
Identification of sulfur species in marine sediments from Seto Inland Sea using XAFS

17AG002 Reiko Urade : Graduate School of Agriculture, Kyoto University
Structural analysis of food proteins by vacuum ultraviolet circular dichroism spectroscopy

17AG003 Yoshihiro Aiura : National Institute of Advanced Industrial Science and Technology
Photoemission spectroscopy study on electronic behavior of electron carriers doped on the fractured surface of oxide single crystals

17AG004 Shaolong He : Ningbo Institute of Industrial Technology, CAS
Systematic studies of the interplay between magnetism and superconducitivity in EuFeAs122 superconductors

17AG005 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Structural analysis of glycoprotein interacted with glycolipid membrane using vacuum-ultraviolet circular dichroism

17AG006 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Membrane-interaction study of myelin protein using vacuum-ultraviolet circular dichroism

17AG007 Jun'ichiro Mizuki : School of Science and Technology, Kwansei Gakuin University
Angle-resolved photoelectron spectroscopy study on Ce1-2-10 systems

17AG009 Hitoshi Yamaoka : RIKEN SPring-8 Center
Photoelectron spectroscopy study of Yb compounds

17AG010 Baojie Feng : Institute for Solid State Physics, University of Tokyo
High resolution ARPES study of graphene-like materials

17AG011 Baojie Feng : Institute for Solid State Physics, University of Tokyo
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17AG012 Shunsuke Tsuda : National Institute for Materials Science
Photoemission study of multi-layered system of Sr-Cr-O compounds

17AG013 Yasuyuki Maki : School of Science and Engineering, Gunma University
Effect of molecular weight on the conformational change of galactomannan induced by mixing with xanthan

17AG014 Hyeong-Do Kim: IBS-CCES, Seoul National University
Electronic structure of kitaev materials Na_2IrO_3 and Li_2IrO_3 probed by inverse photoemission spectroscopy

17AG015 Tomohiko Saitoh : Faculty of Science, Tokyo University of Science
Electronic structure study of delafossite-type oxides type oxides $CuMO_2$ (M=Mn, Fe)

17AG016 Joseph Shapter : Flinders University
High resolution probing of carbon nanotube energy level structure

17AG017 Yoshiyuki Ohtsubo : Spin-polarized electronic states on polar surfaces of topological Kondo insulator
Spin-polarized electronic states on polar surfaces of topological Kondo insulator

17AG019 Shinji Kuroda : Graduate School of Pure and Applied Sciences, University of Tsukuba
ARPES measurements on mixed crystals and hybrid structures of topological crystalline insulator SnTe

17AG020 Hiroaki Anzai : Graduate School of Engineering, Osaka Prefecture University
Synchrotron radiation photoemission study of organic radical crystal

17AG021 Hiroaki Anzai : Graduate School of Engineering, Osaka Prefecture University
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18BG022 Gopeshwar Dhar Dwivedi : Department of Physics, National Sun Yat-sen University

ARPES study of Mn_3O_4 and $Mn_{1.5}Cr_{1.5}O_4$ films grown at MgO(001) substrate

18BG023 Denis Vyalikh : Donostia International Physics Center (DIPC)

Insight into the spin-texture of Shockley and Dirac states handling by competitive spin-orbit and exchange magnetic interactions in $GdRh_2Si_2$, $HoRh_2Si_2$, $GdIr_2Si_2$ and $YbIr_2Si_2$ materials

18BG024 Ilya Klimovskikh : Saint Petersburg State University

Spin structure of the gapped Dirac cone of first antiferromagnetic topological insulator $MnBi_2Te_4$

18BG026 Alexander Shikin : Saint Petersburg State University

Energy gap open at the Dirac point in Gd- and Mn-doped topological insulators with different magnetic doping level, stoichiometry and localization of the Dirac point relative to the Fermi level for analysis of realization of 2D surface ferromagnetism and its manipulation by laser

18BG027 Alexander Shikin : Saint Petersburg State University

Resonance photoemission study of the energy gap open at the Dirac point and the reasons of the gap formation in Mn- and Gd-doped magnetic topological insulators

18BG028 Yoshihiro Aiura : National Institute of Advanced Industrial Science and Technology

A photoemission study on gap-state evolution of $SrTiO_3$(001) surface by in-situ potassium deposition

18BG029 Heun Tae Lee : Graduate School of Engineering, Osaka University

Photoelectron spectroscopy of thin-film beta tungsten

18BG030 Yudai Izumi : Hiroshima Synchrotron Radiation Center, Hiroshima University

High resolution ARPES measurement for the contribution of electron-phonon parameter in metal mixed crystal

18BG031 Shiv Kumar : Hiroshima Synchrotron Radiation Center, Hiroshima University

Electronic band structure and Fermi surface study of BiPd superconductor from ARPES

18BG032 Momoko Furuta : MILBON

Structural analysis of hair protein denaturation using vacuum-ultraviolet circular dichroism

18BG033 Keisuke Fukutani : Institute for Basic Science

High-resolution angle-resolved photoemission studies on the surface of low-dimensional excitonic insulators

18BG034 K. Asokan : Inter University Accelerator Centre

Electronic and magnetic structures of Iridates using X-ray absorption and X-ray magnetic dichorism based techniques

18BG035 Hideaki Iwasawa : Graduate School of Science, Hiroshima University

Extraction and evaluation of intrinsic many-body interactions in high-Tc cuprate supercondcutors

18BG036 Hideaki Iwasawa : Graduate School of Science, Hiroshima University

Metal-insulator transition of Mott-insulator Ca_2RuO_4

18BG037 Hideaki Iwasawa : Graduate School of Science, Hiroshima University

Observation of Rashba splitting in high-Tc cuprate superconductor $YBa_2Cu_3O_7$

18BG038 Akio Kimura : Graduate School of Science, Hiroshima University

Synchrotron radiation spin resolved ARPES study of Heusler-type magnetic Weyl semimetals

18BG039 Akio Kimura : Graduate School of Science, Hiroshima University

SR-ARPES study of non-symmorphic Dirac line node materials including rare-earth elements II

18BG040 Akio Kimura : Graduate School of Science, Hiroshima University

SR-ARPES study of carrier tuned half-metallic Heusler alloy films

18BG042 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University

Effects of sugars on structural stability of apo-myoglobin investigated by VUVCD spectroscopy

18BG043 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University

Study on a transition of new Ce compound by mean of angle resolved photoemission spectroscopy

18BG044 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University

Study on metal-semiconductor transition of mineral tetrahedrite $Cu_{12}Sb_4As_{13}$ by mean of photoemission and absorption spectroscopies

18BG045 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University

Study on valence transition of $YbInCu_4$ by mean of low-energy angle resolved photoemission spectroscopy

18BG046 Markus Donath : Westfälische Wilhelms-Universität

Exchange vs. spin-orbit interaction at magnet/heavy-metal interfaces

18BG047 Koji Miyamoto : Hiroshima Synchrotron Radiation Center, Hiroshima University

Modification of spin-polarized surface state due to a breaking mirror plane

18BG048 Andrev Kamilievich Kaveev : Ioffe Physical-Technical Institute of the Russian Academy of Sciences

Cation distribution and magnetic properties of $NiFe_2O_4$ nanofilms on MgO and $SrTiO_3$ substrates: XAS and XMCD soft X-ray studies

18BG049 Yasuyuki Maki : Faculty of Science, Kyushu University

Measurement of helix amount of partially denatured collagen by vacuum-ultraviolet circular dichroism

18BG050 Masashi Arita : Hiroshima Synchrotron Radiation Center, Hiroshima University

Angle-resolved photoemission study of FeSi II

18BG051 Yang Lexian : Tsinghua University

Evolution of heavy fermion states in the valance fluctuating compound $EuNi_2P_{2-x}As_x$

18BG052 Yasuyuki Maki : Faculty of Science, Kyushu University

Temperature dependence of vacuum-ultraviolet circular dichroism spectra of aqueous hydroxypropyl cellulose

18BU001 Fuminori Katou : Graduate School of Biomedical & Health Sciences, Hiroshima University

Structural analysis of DNA gyrase inhibitor in Staphylococcus aureus

18BU002 Takashi Tokushima : MAX IV Laboratory, Lund University

A feasibility stud of the atomic hydrogen cleaning of the carbon contamination on optical elements

18BU003 Ying Jin : National Center for Materials Service Safety, University of Science and Technology Beijing

Ex-situ/in-situ soft x-ray absorption investigation towards corrosion of Cu and passivation behavior of Ti

18BU004 Kazuhiro Hono : Graduate School of Pure and Applied Sciences, University of Tsukuba

Spin-resolved photoemission spectroscopy study for half-metal Heusler compounds

18BU005 Alexander Shikin : Saint Petersburg State University

Anomalously large energy gap open at the Dirac point in new class of magnetically ordered topological insulators and temperature dependence of the Dirac cone structure

18BU006 Alexander Shikin : Saint Petersburg State University

Electronic structure and anomalously large energy gap open at the Dirac point in new class of magnetically ordered topological insulators at different temperatures and resonance photoemission study of the Mn-derived states in the region of the gap

18BU007 Rohit Medwal : National Institute of Education (NIE), Nanyang Technological University (NTU)
Investigation of tunable spin orbit interaction at Rashba hetero-interfaces

18BU008 Takayoshi Yokoya : Graduate School of Natural Science and Technology, Okayama University
Electronic structure study of functional materials at BL-5(FY2018, Latter period)

18BU009 Shaolong He : Ningbo Institute of Industrial Technology, CAS
ARPES study of the evolution of electronic structures of Yb-doped SmB_6

18BU010 Taro Tamada : National Institutes for Quantum and Radiological Science and Technology
Spectrum measurement of human de novo evolved gene product NCYM using vacuum-ultraviolet circular dichroism

18BU011 Shinichi Tate : Graduate School of Science, Hiroshima University
The development of quality check method based on the protein structure

18BU012 Sergey Suturin : Ioffe Physical-Technical Institute of the Russian Academy of Sciences
XMCD study of the substrate dependent stress induced magnetic anisotropy in epitaxial nanoscale YIG layers

18BU013 Shiv Kumar : Hiroshima Synchrotron Radiation Center, Hiroshima University
X-ray absorption spectroscopy (XAS) study of Pr-doped La_2CoFeO_6 double perovskite materials

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19AG001 Kyunghoi Kim: RIKEN SPring-8 Center
A study on mechanism of hydrogen sulfide and phosphate removal with oyster shells by XAFS analysis

19AG002 Hitoshi Yamaoka: RIKEN SPring-8 Center
Angle-resolved photoelectron spectroscopy study on (Ce, La)Ru2Al10 systems

19AG003 Satoshi Asaoka : Kobe University Research Center for Inland Seas
Chemical composition of calcium phosphate in fertilization pellets produced from methane fermented digestive liquid

19AG004 Chaoyu Chen : Southern University of Science and Technology
Electronic structure of elementary excitation in quantum spin liquid

19AG005 Baojie Feng : Institute of Physics, Chinese Academy of Sciences
High-resolution ARPES measurements of honeycomb borophene

19AG006 Ya Feng : Ningbo Institute of Industrial Technology, CAS
ARPES study of silicene

19AG007 Ya Feng : Ningbo Institute of Industrial Technology, CAS
ARPES study of a Dirac semimetal candidate

19AG008 Ying Jin : National Center for Materials Service Safety, University of Science and Technology Beijing
Ex-situ/in-situ soft x-ray absorption investigation towards passivation behavior of Ti

19AG009 Shaolong He : Ningbo Institute of Industrial Technology, CAS
ARPES study of a new type-II Dirac semimetal candidate $NiTe_2$

19AG011 Jun-ichi Takahashi : Graduate School of Engineering, Yokohama National University
Vacuum-ultraviolet circular dichroism analysis of optical activity emergence in amino acid thin films by circularly-polarized light irradiation

19AG012 Kenta Kuroda : Institute for Solid State Physics, University of Tokyo
Antiferromagnetic electronic-structures under devil's staircase in cerium monopnictide

19AG013 Kaname Kanai : Faculty of Science and Technology, Tokyo University of Science
Elucidation of electronic structure of organometallic layers grown on metal surface

19AG014 Chang Liu : Southern University of Science and Technology
ARPES study on Zintl phase $Ba_3Cd_2As_4$ - A proposed topological crystalline insulator protected by C_2 rotational symmetry

19AG015 Chang Liu : Southern University of Science and Technology
Spin-resolved ARPES measurements on the single-spin Weyl bands in kagome ferromagnet $Co_3Sn_2S_2$

19AG016 Andrev Kamilievich Kaveev : Ioffe Physical-Technical Institute of the Russian Academy of Sciences
ARPES studies of the polarization-dependent features of the electronic structure of ultrathin fferromagnetic films grown on the PST and BSTS topological insulators for spintronic applications

19AG017 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Magnetic properties of magnetic monatomic layers intercalated under monolayer hexagonal boron nitride

19AG018 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Interlayer magnetic coupling between transition metal layers through monolayer hexagonal boron nitride

19AG019 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Magnetic properties and structures of magnetic surface clusters

19AG020 Kazuhiro Hono : Graduate School of Pure and Applied Sciences, University of Tsukuba
Synchrotron radiation spin-resolved ARPES study for thin of half-metal Heusler compounds $Co_2FeGa_{0.5}Ge_{0.5}$

19AG022 Yoshihisa Matsumoto : Institute of Innovative Research, Tokyo Institute of Technology
Analysis of the effects of temperature on the secondary structure of proteins involved in DNA damage response and repair

19AG023 Satomi Inaba : Japan Synchrotron Radiation Research Institute
Solution structures of signaling molecules SH2 domain and its complex analyzed using VUVCD

19AG024 Shinji Kuroda : Graduate School of Pure and Applied Sciences, University of Tsukuba
ARPES measurements on mixed crystals of topological crystalline insulator SnTe

19AG025 Yudai Izumi : Hiroshima Synchrotron Radiation Center, Hiroshima University
VUV-CD spectroscopy of histone proteins extracted from human cancer cells

19AG026 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Relationship between structural parameters of sugars and structural stability of proteins

19AG027 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Interaction study of MBP fragment and liposome membrane

19AG028 Takashi Mizokawa : Faculty of Science and Engineering, Waseda University
Unusual thermoelectric effect and excitonic correlation in layered chalcogenides/pnictides

19AG029 Masaru Kato : Faculty of Env.Earth Science, Hokkaido University
Observation of electronic states of monolayer graphene on metals

19AG030 Shin-ichi Wada : Graduate School of Science, Hiroshima University
Substitution effect of molecular conductivity probed by resonant Auger spectroscopy

19AG031 Shin-ichi Wada : Graduate School of Science, Hiroshima University
Ion desorption of cor-excited organic monolayers using pulsed-HV time-of-flight mass spectrometer

19AG032 Naoki Ishimatsu : Graduate School of Science, Hiroshima University
XMCD study on temperature dependence of Gd and Co magnetic moments in Laves phase hydride $GdCo_2H_3$

19AG033 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
VUV-CD measurements of DNA repair proteins

19AG034 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
Resonant photo-electron spectroscopy of bromo-uracil

19AG035 Yasumasa Hikosaka : Institute of Liberal Arts and Science at University of Toyama
Ion time-of-flight mass spectrometry for ion desorption after molecular inner-shell excitation III

19AG036 Atsushi Baba : MILBON
Structural analysis of hair protein using vacuum-ultraviolet circular dichroism

19AG037 Masato Sakano : Graduate School of Engineering, University of Tokyo
Topological transition induced by charge density wave in $NbTe_2$

19AG038 Shinjiro Hayakawa : Graduate School of Engineering, Hiroshima University
Basic evaluation of beamline performance for beamline sophistication

19AG039 Takayoshi Yokoya : Graduate School of Natural Science and Technology, Okayama Unive
Micro ARPES study of layered transition metal nitride TiNCl

19AG040 M. Zahid Hasan : Princeton University
Spin Texture and Topology of a Ferromagnetic Weyl Semimetal, $Co_3Sn_2S_2$

19AG041 Hideaki Iwasawa : Graduate School of Science, Hiroshima University
High-resolution ARPES on Sr_2RuO_4 under uniaxial pressure II

19AG042 Hideaki Iwasawa : Graduate School of Science, Hiroshima University
Uncovering unusual electronic states in high-Tc cuprate superconductor $La_{2-x}Sr_xCuO_4$

19AG043 Masashi Arita : Hiroshima Synchrotron Radiation Center, Hiroshima University
Angle-resolved photoemission study of FeSi[110]

19AG044 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University
Study on valence transition of YbInCu4 by mean of low-energy angle resolved photoemission spectroscopy II

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Study on metal-semiconductor transition of mineral tetrahedrite $Cu_{12}As_4As_{13}$ by mean of photoemission and absorption spectroscopies

19AG046 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University
Study on a transition of new Ce compound by mean of angle resolved photoemission spectroscopy II

19AG047 Takashi Tokushima : MAX IV Laboratory, Lund University
A feasibility stud of the atomic hydrogen cleaning of the carbon contamination on optical elements 2

19AG048 Alexander Shikin : Saint Petersburg State University
Details of electronic structure of antiferromagnetic magnetically-ordered topological insulators of different stoichiometry and their modification with temperature in the region of the Neel temperature

19AG049 Alexander Shikin : Saint Petersburg State University
Comparative ARPES analysis of electronic structure modification of the Cr- and Gd-doped topological insulators under synchrotron and laser photoexcitation

19AG050 Vladimir Andreevich Golyashov : Rzhanov Institute of Semiconductor Physics of the Siberian Branch of the Russian Academy of Sciences
ARPES study of the emerging topological states on the (111) surface of the MBE grown In-doped $Pb_xSn_{1-x}Te$ thin films with compositions outside topological crystalline insulator region.

19AG051 Guodong Liu : Institute of Physics, Chinese Academy of Sciences
A study of layer-dependent electronic structure on the new nodal-line ferromagnetic semimetal Fe_3GeTe_2

19AG052 Akio Kimura : Graduate School of Science, Hiroshima University
Observation of surface orbital textures in antiferromagnetic topological insulators

19AG053 Akio Kimura : Graduate School of Science, Hiroshima University
Angular and orbital resolved ARPES of Dirac materials that belong to non-symmorphic space group

19AG054 Akio Kimura : Graduate School of Science, Hiroshima University
Observation and control of tilted Weyl cones of the Heusler-type FM thin films by spin-resolved ARPES with SR

19AG055 Mario Novak : University of Zagreb
Revealing “side surface states” and bulk states of the topological Dirac line-node semimetals ZrSiS/HfSiS
19AG056 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University
Study of spin-electronic states of topological materials in the temperature-induced t phase transition
19AG057 Eike Fabian Schwier : Hiroshima Synchrotron Radiation Center, Hiroshima University
High-resolution ARPES investigation of the herringbone reconstruction on Au(111)
19AG058 Baojie Feng : Institute of Physics, Chinese Academy of Sciences
ARPES measurements of bulk and single-layer ruthenium chloride
19AU001 Ritsuko Eguchi: Graduate School of Natural Science and Technology, Okayama University
Study of the electronic structure of $AgxBi_2Se_3$ by Micro ARPES
19AU002 Chang Liu : Southern University of Science and Technology
High resolution laser-ARPES study on magnetic topological insulators MnBhTe4 and $MnBi_4Te_7$
19AU003 Turgut Yilmaz : National Synchrotron Light Source II, Brookhaven National Laboratory
Angle resolved photoemission study of Cr-doped Bi_2Se_3 to search for the quantum anomalous Hall state
19AU004 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University
Exploration of target materials for out-of-plane spin detection
19AU005 Shin Imada : College of Science and Engineering, Ritsumeikan University
Core-level MCD of transition metal -Mn Sb half Heusler ferromagnets
19AU006 Atushi Yamasaki : Faculty of Science and Engineering, Konan University
Electronic structures of Mn-based oxypnictides studied by photoemission spectroscopy
19AU007 Chaoyu Chen : Southern University of Science and Technology
Spatial resolved Laser-ARPES study on magnetic topological insulators $Mn_2Bi_2Te_5$, doped
19AU008 Kaname Kanai : Faculty of Science and Technology, Tokyo University of Science
Elucidation of electronic structure of organometallic layers grown on metal surface
19AU009 Kazuhiro Hono : Graduate School of Pure and Applied Sciences, University of Tsukuba
The observation of the composition dependance of the electronic in half-metal Heusler alloy $Co_2Fe(Ga_{0.5}Ge_{0.5})$
19BG001 Shinya Yagi : EcoTopia Science Institute, Nagoya University
Chemical state characterization of vulcanized materials by Sulfur K-edge NEXAFS
19BG002 Hitoshi Yamaoka : RIKEN SPring-8 Center
Photoelectron spectroscopy of Yb_4TGe_8(T=Cr, Mn) II
19BG003 Takashi Mizokawa : Faculty of Science and Engineering, Waseda University
Topological band structure of chiral Ir compounds
19BG004 Shin-ichi Wada : Graduate School of Science, Hiroshima University
Substitution effect of molecular conductivity probed by resonant Auger spectroscopy II
19BG005 Shin-ichi Wada : Graduate School of Science, Hiroshima University
Ion desorption of core-excited organic monolayers using pulsed-HV time-of-flight mass spectrometer II
19BG006 Chaoyu Chen : Southern University of Science and Technology
Electronic structure and spin texture determination of magnetic Weyl semimetals
19BG007 Baojie Feng : Institute of Physics, Chinese Academy of Sciences
Investigation of band structures of tin oxide
19BG009 Shinjiro Hayakawa : Graduate School of Engineering, Hiroshima University
Sulfur K-edge XAFS analysis of acid decomposition of diethyl-dithio carbamate (DDTC)
19BG010 Yasumasa Hikosaka : Institute of Liberal Arts and Science at University of Toyama
Core-hole decay processes in molecules adsorbed on surface
19BG011 Satoshi Asaoka : Kobe University Research Center for Inland Seas

Identification of sulfur species in marine sediments from western part of Seto Inland Sea, Japan using XAFS

19BG012 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University
Study of spin-electronic states of High Tc superconductors Bi2212, Bi2201

19BG013 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University
Experimental verification of Chirality Induced Spin Selectivity (CISS) effect on Chiral molecule

19BG014 Kenya Shimada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Uncovering nonsymmorphic symmetry protected hidden spin polarization in inversion-symmetric bulk BiOI

19BG015 Teppei Yoshida : Graduate School of Human and Environmental Studies, Kyoto University
Observation of the Mott transition for $Ca_3Ru_{2-x}Ti_xO_7$ studied by ARPES

19BG016 Daiki Ootsuki : Graduate School of Human and Environmental Studies, Kyoto University
ARPES study of the metal-insulator transition in Ru pnictides

19BG017 Hideaki Iwasawa : Graduate School of Science, Hiroshima University
High-resolution ARPES on Sr_2RuO_4 under uniaxial pressure III

19BG018 Hideaki Iwasawa : Graduate School of Science, Hiroshima University
Quantitative evaluation of low to high energy-scale interactions in high-Tc cuprate superconductors

19BG019 Naoki Ishimatsu : Graduate School of Science, Hiroshima University
XMCD study on temperature dependence of Gd and Co magnetic moments in Laves phase hydride $GdCo_2H_3$

19BG020 Yudai Izumi : Hiroshima Synchrotron Radiation Center, Hiroshima University
VUV-CD measurements of Heat-stressed histone proteins

19BG021 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
VUV-CD measurements of DNA repair proteins

19BG022 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
Resonant photo-electron spectroscopy of bromo-uracil

19BG023 Yoshihisa Matsumoto : Institute of Innovative Research, Tokyo Institute of Technology
Analysis of the effects of temperature on the secondary structure of proteins involved in DNA damage response and repair

19BG024 Shaolong He : Ningbo Institute of Industrial Technology, CAS
ARPES study of type-II Dirac points in $NiTe_2$

19BG025 Shaolong He : Ningbo Institute of Industrial Technology, CAS
ARPES study of type-II nodal loop in trigonal layered $PtBi_2$

19BG026 Markus Donath : Westfälische Wilhelms-Universität
Ultrathin ferromagnetic films on spin-orbit-influenced metals: Interplay between exchange and spin-orbit interaction

19BG027 Yasuyuki Maki : Faculty of Science, Kyushu University
Secondary-structure analysis of denatured collagen by vacuum-ultraviolet circular dichroism

19BG028 Ya Feng : Ningbo Institute of Industrial Technology, CAS
ARPES study of silicon nano-ribbons

19BG029 Takashi Komesu : University of Nebraska-Lincoln
The electronic structure investigation on Pd doped $SrIrO_3$ thin film

19BG031 Shilong Wu : University of Cologne
Band structure investigation of Iron/MoS_2 interfaces

19BG032 Jun-ichi Takahashi : Graduate School of Engineering, Yokohama National University
Vacuum-ultraviolet circular dichroism analysis of optical activity emergence in amino acid thin films by circularly-polarized light irradiation

19BG033 Mario Novak : University of Zagreb

ARPES study of non-uniform charge transfer and circular dichroism in Vanadium intercalated NbS_2

19BG034 Hemian Yi : The Pennsylvania State University

Exploring the topological superconductivity in the heterostructures of topological insulator grown on $NbSe_2$ thin films

19BG035 Tian Qian : Institute of Physics, Chinese Academy of Sciences

ARPES investigation of new type of topological crystalline insulator $Ba_3Cd_2As_4$

19BG036 Shin Imada : College of Science and Engineering, Ritsumeikan University

Angle-resolved photoemission and k_z dispersion of half-metallic NiMnSb

19BG037 Shin Imada : College of Science and Engineering, Ritsumeikan University

Determination of spin and orbital quantum states of the surface electronic state of Bi (111)

19BG038 Hiroaki Yoshida : Graduate School of Science, Hiroshima University

Soft X-ray absorption spectra of copper ion complexes included in cyclodextrin

19BG039 Hiroaki Yoshida : Graduate School of Science, Hiroshima University

Electronic states of Lipoic acid and related molecules included in cyclodextrin

19BG040 Hiroaki Yoshida : Graduate School of Science, Hiroshima University

Circular dichroism of cyclodextrin and lipoic acid included in cyclodextrin

19BG041 Turgut Yilmaz : National Synchrotron Light Source II, Brookhaven National Laboratory

Interface electronic structure of Bi_2Se_3 / VSe_2 heterostructure

19BG042 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University

Study on electronic structure of $YbInCu_{5-x}Al_x$ by mean of low-energy photoemission spectroscopy

19BG043 Kazuhiro Hono : Graduate School of Pure and Applied Sciences, University of Tsukuba

The elucidation of spin-polarized electronic structure of half-metal Heusler alloy $Co_2FeGa_{0.5}Ge_{0.5}$/Ag, NiAl interfaces

19BG044 Chaoyu Chen : Southern University of Science and Technology

Electronic structure of elementary excitation in quantum spin liquid candidate 1T-TaS_2

19BG045 Masato Sakano : Graduate School of Engineering, University of Tokyo

Spin-polarized electronic structure in chiral crystal structure (II)

19BG046 Keiki Fukumoto : KEK

Estimation of energy levels in high efficiency organic electroluminescence materials

19BG047 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University

Structural change of oligopeptide induced by membrane interaction

19BG048 Mario Novak : University of Zagreb

Detecting the surface states of the topological Dirac line-node semimetals HfSiS on the (100) surface

19BG049 Akio Kimura : Graduate School of Science, Hiroshima University

Exploring an axion insulator phase in Eu based antiferromagnetic materials

19BG050 Akio Kimura : Graduate School of Science, Hiroshima University

Unveiling surface Fermi arcs and their magnetization direction dependent spin textures of the Weyl ferromagnetic alloy films

19BG051 Masashi Arita : Hiroshima Synchrotron Radiation Center, Hiroshima University

Angle-resolved photoemission study of rapping surface SmB_6[110]

19BG052 Masashi Arita : Hiroshima Synchrotron Radiation Center, Hiroshima University

Spin and angle resolved photoemission study of FeSi

19BG053 Akio Kimura : Hiroshima Synchrotron Radiation Center, Hiroshima University

High-resolution ARPES study of BiSbTe3 and intercalated topological insulators Bi_2Se_3

19BU001 Hitoshi Suzuki : Graduate School of Advanced Sciences of Matter, Hiroshima University

Structural analysis of graphene nanomesh fabricated by bottom-up method on Cu surface

19BU002 Chang Liu : Southern University of Science and Technology

High resolution ARPES study on magnetic topological insulators $Mn(Bi_{1-x}Sb_x)_2Te_4$

19BU003 Masaru Kato : Faculty of Env.Earth Science, Hokkaido University

Understanding interactions between monolayer graphene and metal supports

19BU004 Martin Andresson : Chalmers University of Technology

Far UV-CD spectroscopy of protein-nanomaterials interaction

19BU005 Chaoyu Chen : Southern University of Science and Technology

Electronic structure of the parent compound of superconducting infinite-layer nickelates by XPS, IPES and XAS

19BU006 K. Asokan : Inter University Accelerator Centre

Electronic and magnetic structures of Iridates using X-ray absorption and X-ray magnetic dichorism based techniques

19BG007 Masahiro Tsujimoto : Institute of Space and Astronautical Science, Japan Aerospace Exploration Agency

Transmission curve measurement of the vacuum window installed in the X-ray astronomy satellite

19BG008 Artem Rybkin : Saint Petersburg State University

Laser-ARPES measurements of interface states in Graphene/Au/Co system with loop dislocation network

19BU009 Arghya Taraphder : Indian Institute of Technology Kharagpur

Instabilities and their competition in doped or intercalated VSe_2

19BU010 Friedrich Reinert : Julius-Maximilians-Universität Würzburg

Probing the bulk and surface signatures of the time-reversal breaking in the electronic structure of the magnetically doped topological insulator V: $(Bi, Sb)_2Te_3$ with high resolution UV-ARPES

19BU011 Ken Terao : Graduate School of Science, Osaka University

Conformational change of double helical xanthan in aqueous solution

19BU012 Chang Liu : Southern University of Science and Technology

High resolution ARPES study on magnetic topological insulators $Mn(Bi_{1-x}Sb_x)_2Te_4$

19BU013 Atsushi Baba : MILBON

Visualization of denaturation process of hair cross section by hydrogen peroxide using vacuum ultraviolet circular dichroism

19BU014 Jens Ruediger Stellhorn : Graduate School of Engineering, Hiroshima University

Structure of a novel amorphous organic-inorganic hybrid tin cluster exhibiting nonlinear optical effects by Sn XAFS measurements

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20AG001 Artem Rybkin : Saint Petersburg State University

Topological protected states hosted by loop dislocation network at the interface of Au monolayer and Co substrate

20AG003 Chaoyu Chen : Southern University of Science and Technology

Electronic structure and spin polarization of magnetic Weyl semimetals candidate Sm_2CuGe_6 and Sm_2PdGe_6

20AG004 Ke Deng : Southern University of Science and Technology

Revealing electronic structure of n-doped axion insulator $EuIn_2As_2$

20AG005 Cai Liu : Southern University of Science and Technology

Electronic structure and spin polarization of quantum spin liquid candidates Na_2IrO_3 and Li_2IrO_3

20AG007 Baojie Feng : Institute of Physics, Chinese Academy of Sciences

ARPES study of the electronic structure of crystalline ice

20AG008 Baojie Feng : Institute of Physics, Chinese Academy of Sciences

ARPES study of a two-dimensional topological insulator

20AG009 Andrev Kamilievich Kaveev : Ioffe Physical-Technical Institute of the Russian Academy of Sciences
ARPES studies of the band gap opening near the Dirac point in Ferromagnetic/ topological insulator system based on Se-depleted substrates

20AG010 Andrev Kamilievich Kaveev : Ioffe Physical-Technical Institute of the Russian Academy of Sciences
XAS and XMCD studies of crystal field symmetry of Co and Mn impurities in multi-compound topological insulators

20AG011 Satoshi Asaoka : Kobe University Research Center for Inland Seas
Adsorption mechanisms of nutrients onto filtration media for septic tanks

20AG012 Nao Tsunoji : Graduate School of Engineering, Hiroshima University
XAFS characterization of transition metal and halogen atom in ordered nano-metal oxide

20AG013 Shaolong He : Ningbo Institute of Industrial Technology, CAS
ARPES study of heavy Weyl fermion semimetal

20AG014 Shaolong He : Ningbo Institute of Industrial Technology, CAS
ARPES study of non-symmorphic topological Dirac Insulators

20AG015 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
VUV-CD measurements of DNA repair proteins

20AG016 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
Resonant photo-electron spectroscopy of bromo-uracil

20AG017 Hiroaki Anzai : Graduate School of Engineering, Osaka Prefecture University
Measurements of heavy-fermion bands in the rare-earth compounds $YbAgCu_4$

20AG018 Hiroaki Anzai : Graduate School of Engineering, Osaka Prefecture University
Temperatere dependence of the Kondo resonance peak in photoemission spectra of $YbXCu_4$ (X=Ag, Cd, In, and Sn)

20AG019 Masato Sakano : Graduate School of Engineering, University of Tokyo
Direct observation of electronic structure with coupled spin and valley degrees of freedom in bi-layer WSe_2 flake

20AG020 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University
Study of spin-electronic states of High Tc superconductors Bi2212， Bi2201 and YBCO

20AG021 Xingjiang Zhou : Institute of Physics, Chinese Academy of Sciences
Micro-ARPES study on the free standing single layer FeSe films

20AG022 Shinji Kuroda : Graduate School of Pure and Applied Sciences, University of Tsukuba
ARPES measurements on mixed crystals of topological crystalline insulator SnTe

20AG023 Shinya Hosokawa : Graduate School of Science and Technology, Kumamoto University
Valence-band electronic states of Gd-TM metallic glass alloys having thermal rejuvenation effect

20AG024 Shinya Hosokawa : Graduate School of Science and Technology, Kumamoto University
Conduction-band electronic states of Gd-TM metallic glass alloys having thermal rejuvenation effect

20AG025 Takeshi Kondo : The Institute for Solid State Physics, University of Tokyo
T_c optimization mechanism for comparative study in the multilayered superconductors

20AG026 Teppei Yoshida : Graduate School of Human and Environmental Studies, Kyoto University
Observation of impurity effect and metal-insulator transition for transition for $Ca_3Ru_{2-x}Ti_xO_7$ studied by ARPES

20AG027 Hidetoshi Miyazaki : Department of Physical Science and Engineering, Nagoya Institute of Technology
Direct observation of electronic structure of Heusler-type Fe2VAl alloy studied by three-dimensional angle-resolved photoemission spectroscopy

20AG028 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Electronic structure of chromium oxide grown on graphene

20AG029 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Magnetic properties at an interface between magnetic monatomic layers and hexagonal boron nitride

20AG030 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Magnetic coupling between transition metal layers through monolayer hexagonal boron nitride

20AG031 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Magnetic properties and structures of magnetic surface clusters

20AG032 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Soft X-ray absorption spectroscopy for chromium oxide grown on graphene

20AG033 Naoyuki Maejima : College of Science, Rikkyo University
Magnetic property analysis of Ni_2P thin film on Fe_2P(10-10)

20AG034 Jens Ruediger Stellhorn : Graduate School of Engineering, Hiroshima University
Structure of a novel amorphous organic-inorganic hybrid tin cluster exhibiting nonlinear optical effects by low-energy XAFS measurements

20AG035 Yeonjin Yi : Yonsei University
First determination of full three-dimensional electronic structure and tests on Rashba effect in halide perovskites

20AG037 Shin-ichi Wada : Graduate School of Science, Hiroshima University
Evaluation of molecular conductivity probed by resonant Auger spectroscopy

20AG038 Shin-ichi Wada : Graduate School of Science, Hiroshima University
Evaluation of molecular conductivity probed by soft X-ray absorption spectroscopy

20AG039 Yasumasa Hikosaka : Institute of Liberal Arts and Science at University of Toyama
Ion time-of-flight mass spectrometry for ion desorption after molecular inner-shell excitation

20AG040 Yasuyuki Maki : Faculty of Science, Kyushu University
Gelation process of gelatin containing sugars studied by ultra-violet circular dichroism

20AG041 Hu Miao : Oak Ridge National Laboratory
Origin of the gapless surface state in magnetic topological insulator $Mn(Bi,Sb)_2Te_4$

20AG042 Yoshihisa Matsumoto : Institute of Innovative Research, Tokyo Institute of Technology
Analysis of the mechanisms for the combinatorial effects of radiation and hyperthermia based on the secondary structure of DNA repair proteins

20AG043 Yudai Izumi : Hiroshima Synchrotron Radiation Center, Hiroshima University
VUV-CD spectroscopy of chromatin

20AG044 Shinya Nakashita : Graduate School of Engineering, Hiroshima University
Utilization of oyster shells and coal bottom ash mixture for restoration of coastal environment

20AG045 Tian Qian : Institute of Physics, Chinese Academy of Sciences
Exploring connection of Fermi arcs and helical surface states in chiral crystal CoSi

20AG046 Tian Qian : Institute of Physics, Chinese Academy of Sciences
Low temperature and Spin ARPES investigation of possible nodal surface in EuB_6

20AG047 Rohit Medwal : National Institute of Education (NIE), Nanyang Technological University (NTU)
Investigation of the modified Dirac cone in graphene interfacing heavy metal and ferromagnets for tunable spin orbit interaction

20AG049 Shinjiro Hayakawa : Graduate School of Engineering, Hiroshima University
High sensitive determination of film orientation of poly-thiophene films using conversion electron yield XAFS measurements

20AG050 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
VUVCD measurements of monosaccharides

20AG051 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University

Structural stability of proteins induced by mono-saccharides

20AG052 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University

Interaction study of MBP and liposome membrane using LD spectroscopy

20AG053 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University

Angle resolved photoemission spectroscopy of valence transition compounds $YbInCu_4$

20AG054 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University

Study on c-f hybridization of $YbCu_{5-x}Al_x$ by observation of the Kondo peak

20AG055 Hiroaki Yoshida : Graduate School of Science, Hiroshima University

Comparison of soft X-ray absorption spectra of transition metal sulfate

20AG056 Hiroaki Yoshida : Graduate School of Science, Hiroshima University

Electronic states of dihydrolipoic acid included in cyclodextrin

20AG057 Akio Kimura : Graduate School of Science, Hiroshima University

Visualizing surface spin textures of the Heusler-type Weyl ferromagnetic alloys exhibiting a giant anomalous Nernst effect

20AG058 Akio Kimura : Graduate School of Science, Hiroshima University

Exploring a magnetic topological insulator phase in Eu based antiferromagnetic materials

20AG060 Naoki Ishimatsu : Graduate School of Science, Hiroshima University

XMCD study on temperature dependence of Gd and Co magnetic moments in Laves phase hydride $GdCo_2H_3$

20AG062 Chang Liu : Southern University of Science and Technology

High resolution ARPES study on magnetic topological insulators $Mn(Bi_{1-x}Sb_x)_4Te_7$

20AG063 Chang Liu : Southern University of Science and Technology

High resolution ARPES study on magnetic topological insulators $Mn(Bi_{1-x}Sb_x)_2Te_4$

20AG064 Masashi Arita : Hiroshima Synchrotron Radiation Center, Hiroshima University

ARPES study of 3d Kondo insulator FeSi

20AG065 Masashi Arita : Hiroshima Synchrotron Radiation Center, Hiroshima University

Angle resolved photoemission study of $Y_{1-x}Ca_xTiO_3$

20AU001 Masayuki Takahashi : School of Life Science and Technology, Tokyo Institute of Technology

DNA biding of RecA recombinase under molecular crowing conditions

20AU002 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University

ARPES measurement of interface electronic structures between Cr_2O_3 overlayers and graphene grown on Ni(111) surface

20AU003 Tetsuji Sekitani : Graduate School of Advanced Science and Engineering, Hiroshima University

Study of nanocarbon adsorbed on self-assembled monolayer using NEXAFS and XPS

20AU004 Jun Maruyama : Osaka Research Institute of Industrial Science and Technology

Vacuum ultraviolet circular dichroism spectroscopy for carbon nanotube modified with helically aligned nanopores

20AU005 Toshirou Hata : Graduate School of Advanced Science and Engineering, Hiroshima University

Evaluation of the bio-mediated calcium carbonate into the soil pore with XAFS analysis

20AU006 Markus Donath : University of Münster

Spin-orbit-induced splitting of the Tamm surface state of Re(0001)

20AU007 Shiv Kumar : Hiroshima Synchrotron Radiation Center, Hiroshima University

Band structure engineering in topological semimetal candidate CaAuAs

20AU008 Munisa Nurmamat : Graduate School of Advanced Science and Engineering, Hiroshima University

Polarization-dependent ARPES studies on type-II Dirac semimetal $NiTe_2$

20AU009 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University

Low energy ARPES of Eu based antiferromagnetic topological insulator candidate

20AG010 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Angle-resolved photoelectron spectroscopy of strongly correlated materials with odd parity order

20AU011 Chang Liu : Southern University of Science and Technology
Probing a new type of spin-splitting effect in antiferromagnets

20AU012 Xingjiang Zhou : University of Chinese Academy of Sciences
Band Structure Investigation of iron superconductor $Ba_{0.6}K_{0.4}Fe_2As_2$

20AU013 Jun Maruyama : Osaka Research Institute of Industrial Science and Technology
Sensitivity enhancement of vacuum ultraviolet circular dichroism spectroscopy for carbon nanotube modified with helically aligned nanopores

20AU014 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Analysis of membrane-bound conformation of Magainin2

20AU015 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
Structural analysis α-synuclein interacted with membrane

20AU016 Susumu Mineoi : Graduate School of Advanced Science and Engineering, Hiroshima University
Development of degradation analysis methods of functional materials for automobiles by fluorescence and conversion electron yield XAFS measurements

20AU017 Shilong Wu : University of Chinese Academy of Sciences
Spin-ARPES study of topological band structures in $Ca_2Pd_3Sb_4$

20AU018 Kenya Shimada : Hiroshima Synchrotron Radiation Center, Hiroshima University
High-resolution ARPES of heavily overdoped Bi2201: evaluation of coupling parameters

20AU019 Kenya Shimada : Hiroshima Synchrotron Radiation Center, Hiroshima University
ARPES study of the topological surface state in single $Sb_2(Se,Te)_3$ crystals

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21AG001 Toshirou Hata : Graduate School of Advanced Science and Engineering, Hiroshima University
Evaluation of the bio-mediated calcium carbonate into the soil pore with XAFS analysis

21AG002 Yuji Muraoka : Graduate School of Natural Science and Technology, Okayama University
Verification of room temperature ferromagnetic property in Q-carbon by using X-ray MCD method

21AG003 Hitoshi Yamaoka : RIKEN SPring-8 Center
Angle-resolved photoelectron spectroscopy study on (Ce, La)Ru_2Al_{10} systems

21AG004 Baojie Feng : Institute of Physics, Chinese Academy of Sciences
Topological band structure of a breathing Kagome lattice

21AG005 Satoshi Asaoka : Graduate School of Integrated Sciences for Life, Hiroshima University
Adsorption mechanisms of phosphate onto coal fly ash-blast furnace cement composite for septic tanks

21AG006 Takashi Komesu : University of Nebraska-Lincoln
The electronic structure investigation of Pd overlayers on Cr_2O_3 single crystals

21AG007 Yasumasa Hikosaka : Institute of Liberal Arts and Science at University of Toyama
Ion time-of-flight mass spectrometry for ion desorption after molecular inner-shell excitation

21AG008 Hiroaki Anzai : Graduate School of Engineering, Osaka Prefecture University
Material dependence of the Kondo resonance peak in photoemission spectra of Yb_XCu_4 (X=Ag, Cd, In, and Sn)

21AG009 Hiroaki Anzai : Graduate School of Engineering, Osaka Prefecture University
Observation of the heavy-fermion behavior in quadruple perovskite oxides

21AG010 Dmitry Estyunin : Saint Petersburg State University
Contact of antiferromagnetic topological insulator $MnBi_2Te_4$ with Pb and Nb thin films

21AG011 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University
Angle resolved photoemission spectroscopy of chiral magnet $YbNi_3Al_9$

21AG012 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University
Angle resolved photoemission spectroscopy of valence transition compounds $YbInCu_4$

21AG013 Yudai Izumi : Hiroshima Synchrotron Radiation Center, Hiroshima University
Secondary structure analysis of chromatin using VUV-CD spectroscopy

21AG014 Alexander Shikin : Saint Petersburg State University
Modulation of Dirac gap in $MnBi_2Te_4$ and $MnBi_4Te_7$ as competition between the contributions of magnetic exchange interaction and magnetoelectric response

21AG015 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Magnetic properties at an interface between magnetic monatomic layers and hexagonal boron nitride

21AG016 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Magnetic coupling between transition metal layers through monolayer hexagonal boron nitride

21AG017 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Magnetic properties and structures of magnetic surface clusters

21AG018 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
XMCD studies for interfaces between magnetic layers and transition metal oxides grown on graphene/h-BN

21AG019 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Structural stability of proteins induced by disaccharides

21AG020 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
VUVCD measurements of monosaccharides

21AG021 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Interaction study of MBP and liposome membrane

21AG022 C. S. Yadav : Indian Institute of Technology Mandi
Comparative ARPES study of transition metal doped topological compounds $M_{0.05}Bi_{1.95}Se_3$ (M = Au, Pt, and Pd)

21AG023 Jayita Nayak : Indian Institute of Technology Kanpur
Investigation of electronic structure of topological semimetal $SrAl_2Si_2$ and $EuAl_2Si_2$

21AG025 Munisa Nurmamat : Graduate School of Advanced Science and Engineering, Hiroshima University
High-resolution ARPES studies of quasi-one-dimensional transition metal chalcogenides

21AG026 Yoshihisa Matsumoto : Institute of Innovative Research, Tokyo Institute of Technology
Analysis of the combined effects of heat and variant on the secondary structure of DNA repair proteins

21AG027 Yasuyuki Maki : Faculty of Science, Kyushu University
Effect of sucralose on the stability of protein structure

21AG028 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
Observation of nuclear creation process of liquid-liquid phase separation using VUV-CD spectroscopy

21AG029 Hiroyuki Ikemoto : Department of Physics, University of Toyama
Electronic state of the chalcogen chains encapsuled in carbon nanotubes

21AG030 Daiki Ootsuki : Graduate School of Human and Environmental Studies, Kyoto University
Electronic structure analysis of excitonic effects in transition metal chalcogenide compounds

21AG031 Kenta Kuroda : The Institute for Solid State Physics, University of Tokyo
Systematic investigations of many-body interaction between localized and itinerant electrons in cerium monopnictides with unusual magnetic properties

21AG032 Munisa Nurmamat : Graduate School of Advanced Science and Engineering, Hiroshima University
Spin-resolved ARPES studies of quasi-one-dimensional topological surface states of layered tellurides

21AG033 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University

Evaluation of molecular conductivity probed by electron spectroscopy
21AG034 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University
Conductivity evaluation of aromatic molecules probed by soft X-ray absorption spectroscopy
21AG035 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University
Soft X-ray spectroscopy of substrate supported lipid membranes
21AG036 Hiroaki Yoshida : Graduate School of Advanced Science and Engineering, Hiroshima University
Soft x-ray photoelectron spectroscopy of vitamins molecules included in cyclodextrins
21AG037 Hiroaki Yoshida : Graduate School of Advanced Science and Engineering, Hiroshima University
Soft x-ray absorption spectroscopy of vitamins molecules included in cyclodextrins
21AG038 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Exploration of spin-polarized topological nodal lines in Fe based ferromagnetic alloys
21AG039 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Low energy ARPES of antiferromagnetic Weyl semimetals
21AG040 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Synchrotron radiation ARPES study of Dirac nodal line superconductor candidate $ZrP_{2-x}Se_x$
21AG041 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Identification of orbital symmetries in band structures of rare earth compounds with odd parity order
21AG042 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
ARPES measurements of Ti_2O_3 films whose lattice strain controlled by the film thickness
21AG043 Koji Miyamoto : Hiroshima Synchrotron Radiation Center, Hiroshima University
Electronic structure of Bi/Ni on MgO(001)
21AG044 Shinjiro Hayakawa : Graduate School of Advanced Science and Engineering, Hiroshima University
Development of a rod shaped device for conversion electron yield measurements and its application for polarization dependent XAFS measurements
21AG045 Jens Ruediger Stellhorn : Graduate School of Advanced Science and Engineering, Hiroshima University
Structure of a novel amorphous organic inorganic hybrid tin cluster exhibiting nonlinear optical effects by low energy XAFS measurements
21AU001 Toshirou Hata : Graduate School of Science and Technology, Kumamoto University
Valence-band electronic states of Gd-TM metallic glass alloys having thermal rejuvenation effect II
21AU002 Baojie Feng : Institute of Physics, Chinese Academy of Sciences
ARPES study of topological electronic structures in niobium tellurium chloride
21AU003 Jens Ruediger Stellhorn : Graduate School of Advanced Science and Engineering, Hiroshima University
The local environment of S in chalcogenide-based solid state electrolytes by low-energy XAFS measurements
21AU004 Hideaki Iwasawa : National Institutes for Quantum and Radiological Science and Technology
Uncovering oxygen isotope effects on multiple kinks in optimally-doped Bi2212
21AU005 Kazuyuki Sakamoto : Graduate School of Engineering, Osaka University
Investigation of the origin of photo-induced doping on $TlBiSe_2$
21AU006 Sutiman Bambang Sumitro : Brawijaya University
CD spectroscopy-based of astaxanthin-metal ions complexes as efforts to improve the rheology of glycated albumin
21AU007 Shinya Hosokawa: Institute of Industrial Nanomaterials, Kumamoto University
Conduction-band electronic states of Gd-TM metallic glass alloys having thermal rejuvenation effect II
21AU008 Sakura Takeda : Nara Institute of Science and Technology
Spin polarization of valence electrons beneath Si(001) surface
21AU009 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University

Time-resolved measurements of membrane-induced structural change of protein

21AU010 Masaaki Sugiyama : Institute for Integrated Radiation and Nuclear Science, Kyoto University
Structural analysis of ER protein foldase by vacuum ultraviolet circular dichroism spectroscopy

21AU011 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Conformation change of Magainin2 depending on the characteristics of membrane

21AU012 Mohamed Ibrahim : Hiroshima Synchrotron Radiation Center, Hiroshima University
Synchrotron radiation circular dichroism study of exopolysaccharides from marine microbes

21AU013 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University
Study of the electronic structure of the chiral crystal $NbSi_2$

21AU014 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
High-resolution ARPES of rare earth compounds with odd parity order

21BG001 Hitoshi Yamaoka : RIKEN SPring-8 Center
Photoelectron spectroscopy study of $YbCo_2$ and $Yb_{1+x}In_{1-x}Cu_4$

21BG002 Yasumasa Hikosaka : Institute of Liberal Arts and Science at University of Toyama
X-ray photoelectron spectroscopy of PMMA adsorbed on metal surface

21BG003 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University
Study of CISS effect on the chiral crystal $NbSi_2$

21BG004 Masanori Wakisaka : Graduate School of Science, Tohoku University
Elucidation of the electron state of hetero-type one-dimensional bromide-bridged Ni(III) complex chains

21BG005 Zhenyu Wang : Southern University of Science and Technology
Electronic structure and spin polarization of magnetic topological semimetal $EuSb_2$

21BG006 Shin-ichiro Ideta : Hiroshima Synchrotron Radiation Center, Hiroshima University
Reexamination of phase diagram of high-Tc cuprates studied by angle-resolved photoemission spectroscopy

21BG007 Toshirou Hata : Graduate School of Advanced Science and Engineering, Hiroshima University
XAFS analysis of the calcium carbonate precipitation applied under high pressure and low-temperature conditions

21BG008 Shinjiro Hayakawa : Graduate School of Advanced Science and Engineering, Hiroshima University
Characterization of oriented polythiophene thin films with polarization dependent S K-edge XAFS spectroscopy

21BG009 Kazujki Sumida : Japan Atomic Energy Agency
Polarization-dependent spin-resolved ARPES for Heusler-type Weyl ferromagnetic films with half-metallic electronic structures

21BG010 Hiroyuki Ikemoto : Department of Physics, University of Toyama
Electronic state of the chalcogen chains encapsuled in carbon nanotubes

21BG011 Takeshi Kondo : The Institute for Solid State Physics, University of Tokyo
Electronic structure of chiral magnets and Kagome magnets studied by ARPES

21BG012 Kenta Kuroda : The Institute for Solid State Physics, University of Tokyo
Photoelectron intensity angular distribution and breaking selection rule investigated by low-energy synchrotron radiation

21BG013 Kazumasa Okada : Graduate School of Advanced Science and Engineering, Hiroshima University
Study on intermolecular interactions of the water-acetone binary system observed in its near ultraviolet absorption spectra

21BG014 Shinya Hosokawa : Institute of Industrial Nanomaterials, Kumamoto University
Conduction-band electronic states of La-Ni-Al metallic glass alloys having thermal rejuvenation effect

21BG015 Shinya Hosokawa : Institute of Industrial Nanomaterials, Kumamoto University
Conduction-band electronic states of La-Ni-Al metallic glass alloys having thermal rejuvenation effect

21BG016 Heun Tae Lee : Graduate School of Engineering, Osaka University

Photoelectron spectroscopy of beta-tungsten thin-films

21BG017 Chaoyu Chen : Southern University of Science and Technology

Valley-dependent spin polarization in bulk BaMnSb2 with broken inversion symmetry

21BG018 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University

Study of spin-electronic structure of chiral polarized two-dimensional organic/inorganic hybrid perovskite

21BG019 Susumu Mineoi : Graduate School of Advanced Science and Engineering, Hiroshima University

Development of degradation analysis methods of automobile materials by fluorescence yield XAFS measurement

21BG020 Chaoyu Chen : Southern University of Science and Technology

High resolution ARPES study on CsV_3Sb_5 with Cr doping

21BG021 Yasuyuki Maki : Faculty of Science, Kyushu University

Effect of sucralose on the structural stability of myoglobin

21BG022 Teppei Yoshida : Graduate School of Human and Environmental Studies, Kyoto University

Substrate dependence of metal-insulator transition on Ru nanosheets

21BG023 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University

Angle resolved photoemission spectroscopy of valence transition compound $YbInCu_4$(100)

21BG024 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University

Direct observation of c-f hybridization band of valence transition compound YbInCu4(100) by means of angle resolved photoemission spectroscopy

21BG025 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University

Evaluation of molecular conductivity probed by electron spectroscopy 2

21BG026 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University

Conductivity evaluation of aromatic molecules probed by soft X-ray absorption spectroscopy 2

21BG027 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University

Soft X-ray spectroscopy of substrate supported lipid membranes 2

21BG028 Dmitry Estyunin : Saint Petersburg State University

Study of the Dirac point shift and the Dirac point band gap in the intrinsic magnetic topological insulators $Mn(Bi_{1-x},Sb_x)_2Te_4$

21BG029 Koji Miyamoto : Hiroshima Synchrotron Radiation Center, Hiroshima University

Study of superconductivity on Bi/Ni hetero bilayer

21BG030 Koji Miyamoto : Hiroshima Synchrotron Radiation Center, Hiroshima University

The observation of topological surface state different from cleaving surface

21BG031 Shinjiro Hayakawa : Graduate School of Advanced Science and Engineering, Hiroshima University

C K-edge XAFS applications for determination of unsaturated bonds in silicon-bridged polymers

21BG032 Takayoshi Yokoya : Research Institute for Interdisciplinary Science, Okayama University

Synchrotron ARPES of CrO_2: Direct observation of momentum dependence of NQP states

21BG033 Takayoshi Yokoya : Research Institute for Interdisciplinary Science, Okayama University

Direct observation of electronic structure in Se substituted $La(O,F)BiS_{2-x}Se_x$ by synchrotron ARPES

21BG034 Takayoshi Yokoya : Research Institute for Interdisciplinary Science, Okayama University

Electronic structure study of functional materials at BL-5 (FY2021 Latter period)

21BG035 Naoyuki Maejima : College of Science, Rikkyo University

Magnetic property analysis of transition metal phosphide thin film

21BG036 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University

Pressure depedence of Topological phase transition on $TlBiSe_2$ and $TlBiS_2$

21BG037 Alexander Shikin : Saint Petersburg State University

Correlation between modulation of the gap at the Dirac point and changes in stoichiometry in series $MnBi_2Te_4$,

$MnBi_2Se_4$ and $MnBi_2Te_{4-x}Se_x$ with the out-of-plane to in-plane transformation of the magnetic anisotropy

21BG038 Prashant Shahi : Deen Dayal Upadhyaya Gorakhpur University
High-resolution ARPES study of chromium chalcogenide spinels

21BG039 Nao Tsunoji : Graduate School of Advanced Science and Engineering, Hiroshima University
XAFS characterization of transition metal and noble metal in ordered nano-metal oxide

21BG040 Hiroaki Yoshida : Graduate School of Advanced Science and Engineering, Hiroshima University
Soft X-ray absorption spectroscopy of cyclodextrin compounds including a noble metal atom

21BG041 Hiroaki Yoshida : Graduate School of Advanced Science and Engineering, Hiroshima University
Soft x-ray photoelectron spectroscopy of the metal complex included in cyclodextrin

21BG042 Chang Liu : Southern University of Science and Technology
Exploration of the topological surface state gap in $Mn(Bi_{1-x}Sb_x)_4Te_7$

21BG043 Chang Liu : Southern University of Science and Technology
Probing a new type of spin-splitting effect predicted by the spin group theory

21BG044 Chang Liu : Southern University of Science and Technology
Co-modulation of Dirac point and gap size in magnetic topological insulators $SnxMn_{1-x}(Sb_yBi_{1-y})_2Te_4$

21BG045 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Exploration of spin-polarized topological band structures in ferromagnetic Mn based alloys

21BG046 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Exploration of split-band structures and verification of electric toroidal order in CeCoSi

21BG047 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
A determination of orbital symmetries in the band structures of Dirac nodal line superconductor $ZrP_{2-x}Se_x$

21BU001 Masashi Arita : Hiroshima Synchrotron Radiation Center, Hiroshima University
Angle-resolved photoemission study of MnSi

21BU002 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
Observation of nuclear creation process of liquid-liquid phase separation using VUV-CD spectroscopy

21BU003 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Circular dichroism measurements of proteins and peptides in film state

21BU004 Yoko Nittta : Faculty of Core Research Natural Science Division, Ochanomizu University
Structural analysis of strawberry allergen Fra a 1

21BU005 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Band structure of magnetic topological nodal-line semimetal $EuSb_2$

21BU006 Kenta Kuroda : Graduate School of Advanced Science and Engineering, Hiroshima University
Study of spin-orbit coupled electronic structures in magnetic materials

21BU007 Osamu Takahashi : Graduate School of Advanced Science and Engineering, Hiroshima University
XAS study of light damaged organic film

21BU008 Hiroaki Yoshida : Graduate School of Advanced Science and Engineering, Hiroshima University
Hard X-ray absorption spectroscopy of a gold complex included by cyclodextrin

21BU009 Tetsuji Sekitani : Graduate School of Advanced Science and Engineering, Hiroshima University
Study of fullerene adsorbed on self-assembled monolayer using NEXAFS and XPS

21BU010 Naohisa Happo : Graduate School of Information Sciences, Hiroshima City University
EXAFS of Graphite-Intercalation-Compound $Ko_{0.6}Ca_{0.4}C_8$

21BU011 Masahiro Hara : Graduate School of Science and Technology, Kumamoto University
XAS/XMCD measurements of anatase nanoparticles converted from titanium oxide nanosheets

21BU012 Jun Maruyama : Osaka Research Institute of Industrial Science and Technology
Confirmation of vacuum ultraviolet circular dichroism spectra for carbon nanotube modified with helically aligned

nanopores

21BU013 Shin-ichiro Ideta : Hiroshima Synchrotron Radiation Center, Hiroshima University

Spin-resolved photoemission spectroscopy study of the antiferromagnetic metal $NiS_{2-x}Se_x$

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22AG001 Shiv Kumar : Hiroshima Synchrotron Radiation Center, Hiroshima University

High-resolution angle-resolved photoemission study of transition-metal dipnictides $TMPn_2$

22AG002 Kazuyuki Sakamoto : Graduate School of Engineering, Osaka University

Electronic structure of magnetic molecule adsorbed atomic layer superconductor TlPb

22AG003 Mohamed Ibrahim : Hiroshima Synchrotron Radiation Center, Hiroshima University

Synchrotron radiation circular dichroism study of expolysaccharides from marine resources

22AG004 Masanori Wakisaka : Graduate School of Science, Tohoku University

Elucidation of the electronic state of halogen-bridged metal complexes by angle-resolved photoelectron spectroscopy

22AG005 Shin-ichiro Ideta : Hiroshima Synchrotron Radiation Center, Hiroshima University

Electronic structure of cuprate superconductors under uniaxial strain

22AG006 Shin-ichiro Ideta : Hiroshima Synchrotron Radiation Center, Hiroshima University

Reexamination of phase diagram of high-T_c cuprates studied by Super high-resolution ARPES

22AG007 Toshirou Hata : Graduate School of Advanced Science and Engineering, Hiroshima University

XAFS analysis of the Calcium based low-CO_2 emission geomaterials

22AG008 Nao Tsunoji : Graduate School of Advanced Science and Engineering, Hiroshima University

XAFS characterization of transition metal and noble metal in metal oxide catalysts

22AG009 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology

Observation of nuclear creation process of liquid-liquid phase separation using VUV-CD spectroscopy

22AG010 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University

Angle resolved photoemission spectroscopy of 4f chiral magnet

22AG011 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University

Angle resolved photoemission spectroscopy of valence transition compounds $YbInCu_4$(100)

22AG012 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University

Structural analysis of α-synuclein induced with membrane

22AG013 Koichi Matsuo: Hiroshima Synchrotron Radiation Center, Hiroshima University

Structural stability of proteins induced by disaccharides

22AG014 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University

Time-resolved measurements of structural change of protein

22AG015 Masashi Arita : Hiroshima Synchrotron Radiation Center, Hiroshima University

Angle-resolved photoemission study of MnSi

22AG016 Koji Miyamoto : Hiroshima Synchrotron Radiation Center, Hiroshima University

Study of thickness-dependent electronic structure on Bi/Ni hetero bilayer

22AG017 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University

Study of CISS effect on the chiral crystal $NbSi_2$

22AG018 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University

Study of spin-electronic structure of chiral polarized two-dimensional organic/inorganic hybrid perovskite

22AG019 Jayita Nayak : Indian Institute of Technology Kanpur

Band structure engineering of some magnetic topological semimetals

22AG020 Takashi Komesu : University of Nebraska-Lincoln
The electronic structure investigation of dimensionality driven iridates

22AG021 Osamu Takahashi : Graduate School of Advanced Science and Engineering, Hiroshima University
XAS study of light damaged organic film

22AG022 Hiroaki Anzai : Graduate School of Engineering, Osaka Prefecture University
Temperature dependence of the heavy-fermion bands in $YbAgCu_4$

22AG023 Hiroaki Anzai : Graduate School of Engineering, Osaka Prefecture University
Temperature dependence of the heavy-fermion behavior in quadruple perovskite oxides

22AG024 Yoshihisa Matsumoto : Institute of Innovative Research, Tokyo Institute of Technology
Effects of variants of DNA repair proteins on the secondary structure and its temperature sensitivity

22AG025 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University
Electronic relaxation dynamics depending on molecular conductivity probed by electron spectroscopy

22AG026 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University
Exploring functional organic molecules assembled on Au nanoparticles by X-ray absorption spectroscopy

22AG027 Markus Donath : University of Münster
Magnons in ultrathin Ni films

22AG028 Takayoshi Yokoya : Research Institute for Interdisciplinary Science, Okayama University
Angle resolved photoemission spectroscopy in $R_{1-x}Ce_xOBiS_2$(R=La, Pr, Nd): Direct observation of the c-f mixed band

22AG029 Takayoshi Yokoya : Research Institute for Interdisciplinary Science, Okayama University
Electronic structure study in layered nitride chloride superconductor by SR-ARPES

22AG030 Takayoshi Yokoya : Research Institute for Interdisciplinary Science, Okayama University
Electronic structure study of functional materials at BL-5 (FY2022 First half)

22AG031 Kazumasa Okada : Graduate School of Advanced Science and Engineering, Hiroshima University
Study on intermolecular interactions of the water-acetone binary system observed in its near ultraviolet absorption spectra (Part 2)

22AG032 Shinjiro Hayakawa : Graduate School of Advanced Science and Engineering, Hiroshima University
Improvements in XAFS measurements at BL11

22AG033 Akari Takayama : Faculty of Science and Engineering, School of Advanced Science and Engineering, Waseda University
Study of Electronic state of topological heterojunction in Sb/Bi by spin-resolved ARPES

22AG034 Friedrich Reinert : Universitaet Wuerzburg
Investigation of the spin texture in epitaxially grown Te-based thin film quantum materials

22AG035 Friedrich Reinert : Universitaet Wuerzburg
Mapping the temperature dependence of the magnetic gap in a ferromagnetically extended topological insulator: high-resolution ARPES at low temperatures and low photon energies

22AG036 Chang Liu : Southern University of Science and Technology
Study of fermi surface topology on CoP-based $ThCr_2Si_2$ structural compounds ACo_2P_2(A = Ca, Sr, La, Ce, Pr, Nd, Eu)

22AG037 Chang Liu : Southern University of Science and Technology
Spin-resolved ARPES study on magnetic topological insulator $Mn(Bi_{1-x}Sb_x)_2Te_4$

22AG038 Chang Liu : Southern University of Science and Technology
Co-modulation of Dirac point and gap size in magnetic topological insulators $SnxMn_{1-x}(Sb_yBi_{1-y})_2Te_4$

22AG039 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Site-specific quantitative evaluation of electron-electron interaction in CoFe-based half-metallic ferromagnetic

alloys

22AG040 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Topological surface states and carrier tuning in the loop-node superconductor $ZrP_{2-x}Se_x$

22AG041 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Exploration of spin-polarized topological band structures in ferrimagnetic Mn based alloys

22AG042 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Observation of Hopf-links and drumhead spin-polarized surface states in Heusler-type ferromagnets

22AU001 Meng Wang : CEMS, RIKEN
XAS and XMCD study of the relationship between spin-state and magnetoresistivity in $La_{1-x}Sr_xCoO_3$ film

22AU002 Shiv Kumar : Hiroshima Synchrotron Radiation Center, Hiroshima University
High-resolution angle-resolved photoemission study of nodal line topological semimetal

22AU003 Tomohide Saio : Institute of Advanced Medical Sciences, Tokushima University
Unraveling molecular mechanism for protein quality control system

22AU004 Yasuyuki Matoba : Faculty of Pharmacy, Yasuda Women's University
YUVCD measurements of O-acetyl-L-homoserine sulfhydrylase from lactobacillus plantarum

22AU005 Shiv Kumar : Hiroshima Synchrotron Radiation Center, Hiroshima University
X-ray magnetic circular dichroism (XMCD) study of magnetic topological materials

22AU006 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University
Laser ARPES on new 4f chiral magnet $YbNi_3Al_9$

22BG001 Tatsuhito Matsuo : National Institutes for Quantum and Radiological Science and Technology
Secondary structure analysis of amyloid polymorphic fibrils with distinct cytotoxicity using vacuum-ultraviolet circular dichroism

22BG002 Yuji Muraoka : Research Institute for Interdisciplinary Science, Okayama University
Verification of magnetic property for room temperature ferromagnet Q-carbon by using X-ray MCD method

22BG003 Susumu Mineoi : Graduate School of Advanced Science and Engineering, Hiroshima University
Development of chemical state evaluation analysis methods for automotive functional materials by XAFS measurement

22BG004 Shin-ichiro Ideta : Hiroshima Synchrotron Radiation Center, Hiroshima University
Reexamination of phase diagram of high-T_c cuprates studied by super high-resolution ARPES II

22BG005 Shin-ichiro Ideta : Hiroshima Synchrotron Radiation Center, Hiroshima University
Spin-resolved photoemission spectroscopy study of the antiferromagnetic metal $NiS_{2-x}Se_x$ II

22BG006 Toshirou Hata : Graduate School of Advanced Science and Engineering, Hiroshima University
Experimental study on the geological CO_2 deposit via biofilm DAC(Direct Air Capture)

22BG007 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Magnetic properties at the interface between hexagonal boron nitride and magnetic intercalated layers

22BG008 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Magnetic coupling between transition metal layers through monolayer hexagonal boron nitride

22BG009 Hiroyuki Ikemoto : Department of Physics, University of Toyama
Electronic state of the chalcogen chains encapsuled in carbon nanotubes

22BG010 Daiki Ootsuki : Graduate School of Human and Environmental Studies, Kyoto University
Low-energy electronic structure analysis of transition metal chalcogenides with high thermoelectric performance

22BG011 Cai Liu : Southern University of Science and Technology
ARPES Study on Antiferromagnetic topological semimetal Tb_2CuGe_6

22BG012 Cai Liu : Southern University of Science and Technology
Laser-based Angle-Resolved Photoemission Spectroscopy Study on $MnBi_{10}Te_{16}$

22BG013 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University
Electronic structure of new 4f chiral magnet studied by angle resolved photoemission spectroscopy

22BG014 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University
Angle resolved photoemission spectroscopy of new 4f chiral magnet

22BG015 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University
Study on spin texture of new 4f chiral magnet $YbNi_3Al_9$

22BG016 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Circular dichroism measurements of film proteins prepared by spin coater

22BG017 Masahiro Kobayashi : National Institute for Fusion Science
Circular dichroism analysis of molecular structure in amino acid specimen by vacuum-ultraviolet circularly-polarized light irradiation

22BG018 Ryota Akiyama : Graduate School of Science, The University of Tokyo
Modulation of band dispersions by Yb-intercalation into graphene

22BG019 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
Observation of nuclear creation process of liquid-liquid phase separation using VUV-CD spectroscopy

22BG020 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
Analysis of antibody-drug conjugate in tumor cells utilizing synchrotron soft X-ray spectroscopy

22BG021 Masahiro Hara : Graduate School of Science and Technology, Kumamoto University
XAS/XMCD measurements of anatase nanoparticles converted from titanium oxide nanosheets

22BG022 Koji Miyamoto : Hiroshima Synchrotron Radiation Center, Hiroshima University
Spin Hall effect in Pt(001) probed by spin- and angle-resolved photoemission spectroscopy

22BG023 Ke Deng : Southern University of Science and Technology
ARPES Study of a low dimensional chiral Dirac material

22BG024 Chaoyu Chen : Southern University of Science and Technology
ARPES Study on Antiferromagnetic topological semimetal SmAlSi

22BG025 Chaoyu Chen : Southern University of Science and Technology
High resolution ARPES study on Si-terminated and Gd-terminated surfaces of $GdIr_2Si_2$

22BG026 Chaoyu Chen : Southern University of Science and Technology
Investigating the electronic structure and CDW gap structure of $Cs(V_{1-x}Ti_x)_3Sb_5$ by ARPES

22BG027 Chaoyu Chen : Southern University of Science and Technology
Spin-resolved ARPES study on antiferromagnetic topological material CeBi

22BG028 Shiv Kumar : Hiroshima Synchrotron Radiation Center, Hiroshima University
High-resolution ARPES study of room temperature skyrmion ferromagnetic van der Waals semimetal

22BG029 Ke Deng : Southern University of Science and Technology
Revealing the electronic structure of a metallic magnetic van der Waas compound

22BG030 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Dirac Velocity and carrier-tuning in the loop-node superconductor $XrP_{2-x}Se_x$ (X=Zr, Hf)

22BG031 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Exploration of topological band structures in Fe based ferromagnetic alloy films utilizing UHV suitcase

22BG032 Mohamed Ibrahim : Hiroshima Synchrotron Radiation Center, Hiroshima University
Impacts of polysaccharides on protein

22BG033 Naoyuki Maejima : College of Science, Rikkyo University
Magnetic property analysis of transition metal phosphide thin film

22BG034 Fayuan Zhang : Shanghai Institute of Microsystem and information Technology, CAS
The electronic structure study on an air-stable, high mobility van der Waals material $TaCo_2Te_2$ by ARPES

22BG035 Fayuan Zhang : Shanghai Institute of Microsystem and information Technology, CAS
The electronic structure study on $MnBi_{12}Te_{19}$ by laser-based angle-resolved photoemission spectroscopy

22BG036 Kenta Kuroda : Graduate School of Advanced Science and Engineering, Hiroshima University
Exploring low-carrier charge ordered phase by ARPES

22BG037 Kenta Kuroda : Graduate School of Advanced Science and Engineering, Hiroshima University
Peculiar photoelectron intensity angular distribution through band transition investigate be low-energy synchrotron radiation ARPES

22BG038 Hikaru Yabuta : Graduate School of Advanced Science and Engineering, Hiroshima University
Structural analysis of prebiotic depsipeptides by circular-dichroism spectroscopy

22BG039 Masashi Arita : Hiroshima Synchrotron Radiation Center, Hiroshima University
ARPES study of strain-induced topological phase transitions in $Pb_{1-x}Sn_xTe$

22BG040 Yognqing Cai : Southern University of Science and Technology
ARPES study on antiferromagnetic topological semimetal Sm_2CuGe_6

22BG042 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University
Soft X-ray spectroscopy of substrate supported phospholipid membranes

22BG043 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University
Exploring functional organic molecules assembled on Au on of aromatic molecules probed by soft X-ray absorption spectroscopy II

22BG044 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University
Electronic relaxation dynamics depending on molecular conductivity probed by electron spectroscopy II

22BG045 Guodong Liu : Institute of Physics, Chinese Academy of Sciences
A study on the nature of exotic Fermi arc state and magnetic topological states in Rare-earth Monopnictides RX (R = Ce, Nd; X = Sb, Bi) by using spin-resolved ARPES

22BG046 Takeshi Kondo : The Institute for Solid State Physics, University of Tokyo
Light-polarization dependent bulk band dispersions in a transition metal dichalcogenide

22BG047 Hongtao Rong : Southern University of Science and Technology
ARPES study on Co-based magnetic Heusler compound Co_2T_X (T=transition metals；X=Si, Ge, Sn, Al and Ga)

22BG048 Hongtao Rong : Southern University of Science and Technology
Electronic structure study on Mn-doped $(Ge_{1-x}Mn_x)Sb_2Te_4$

22BG049 Chang Liu : Southern University of Science and Technology
ARPES study on a novel surface state in obstructed atomic insulators

22BG050 Chang Liu : Southern University of Science and Technology
Probing the spin structure of antiferromagnetic-induced fermi-arc-like split bands in NdBi

22BG051 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Observation of Weyl cones and surface Fermi arc of Weyl semimetals with broken time-reversal and space-inversion symmetries

22BU001 Shinya Hosokawa : Institute of Industrial Nanomaterials, Kumamoto University
Conduction-band electronic states of La-Ni-Al metallic glass alloys having thermal rejuvenation effect II

22BU002 Shinya Hosokawa : Institute of Industrial Nanomaterials, Kumamoto University
Conduction-band electronic states of La-Ni-Al metallic glass alloys having thermal rejuvenation effect II

22BU003 Zhang Ke : University of Electronic Science and Technology of China
Uncovering nonsymmorphic symmetry protected hidden spin polarization in inversion-symmetric multiphase superconductor $Ce(RhAs)_2$

22BU004 Zhang Ke : University of Electronic Science and Technology of China
Observation of fully spin-polarized Weyl monoloop surface states in rutile-type metal fluorides LiV_2F_6

22BU005 Yoshinori Okada : Okinawa Institute of Science and Technology Graduate University
Investigation of orbital-dependent band structure of spinel oxide superconductor $LiTi_2O_4$ epitaxial films

22BU006 Naohisa Happo : Graduate School of Information Sciences, Hiroshima City University
Ca K-edge EXAFS of Graphite-Intercalation-Compound $K_{0.7}Ca_{0.3}C_8$

22BU007 Kazuyuki Sakamoto : Graduate School of Engineering, Osaka University
Investigation of the electronic structures of magnetic molecule adsorbed topological insulators

22BU008 Nao Tsunoji : Graduate School of Advanced Science and Engineering, Hiroshima University
XAFS characterization of transition metal and noble metal in metal oxide catalysts

22BU009 Martin Andersson : Chalmers University of Technology
Far UV-CD spectroscopy of protein-nanomaterials interaction

22BU010 Hideaki Iwasawa : National Institutes for Quantum and Radiological Science and Technology
Elucidation of spin-electronic states of high-Tc cuprate superconductors

22BU011 Chaoyu Chen : Southern University of Science and Technology
ARPES Study on intrinsic magnetic topological insulator CVT-$MnBi_2Te_4$

22BU012 Shinya Hosokawa : Institute of Industrial Nanomaterials, Kumamoto University
Conduction-band electronic states of La-Ni-Al metallic glass alloys having thermal rejuvenation effect III

22BU013 Shin-ichiro Ideta : Hiroshima Synchrotron Radiation Center, Hiroshima University
Symmetry reduction of the electronic structure in heavily overdoped Pb-Bi2201 observed by ARPES

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23AG001 Kojiro Mimura : Graduate School of Engineering, Osaka Metropolitan University
Fe 3d electronic state in covalent-chain antiferromagnets $TlFeX_2$ (X = S, Se) investigated by resonant photoemission spectroscopy

23AG002 Ying Jin : University of Science and Technology Beijing
Ex-situ soft x-ray absorption investigation towards passivation behavior of Titanium Alloys by Hydrogen charging and Tensioning

23AG003 Takashi Komesu : University of Nebraska-Lincoln
Electronic Structure Investigations of ferromagnetic Pd Overlayers on Cr_2O_3 Single Crystals

23AG005 Akifumi Higashiura : Graduate School of Biomedical and Health Sciences, Hiroshima University
Analysis of intraparticle structure to elucidate the formation mechanism of encapsulin particles

23AG006 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Membrane-bound structure and amyloid fibril formation analysis of α-synuclein peptide

23AG007 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University
Structural change of α_1 acid glycoprotein induced by the membrane interaction

23AG008 Dmitry Estyunin : Saint-Petersburg state university
Modification of electronic structure of an intrinsic magnetic topological insulator $(Mn_{1-x}, A_x)Bi_2Te_4$ by substituting Mn with non-magnetic elements A=(Ge, Pb, Sn)

23AG009 Hiroaki Anzai : Graduate School of Engineering, Osaka Metropolitan University
Observation of Kondo resonance peak in the photoemission spectra of quadruple perovskite oxides

23AG010 Hiroaki Anzai : Graduate School of Engineering, Osaka Metropolitan University
Direct observation of the heavy-fermion bands in $YbXCu_4$(X=Ag, In)

23AG011 Mohamed Ibrahim : Hiroshima Synchrotron Radiation Center, Hiroshima University
Structural and conformational elucidations of carrageenan polysaccharides gels induced by different stimuli using circular dichroism spectroscopy

23AG012 Abdelrahman Mosaad Khattab : Al-Azhar University
Structural and conformational studies of surfactin-derived bacteria using circular dichroism

23AG013 Hitoshi Sato: Hiroshima Synchrotron Radiation Center, Hiroshima University
Electronic structure of new 4f chiral magnet studied by angle resolved photoemission spectroscopy II

23AG014 Hitoshi Sato: Hiroshima Synchrotron Radiation Center, Hiroshima University
Angle resolved photoemission spectroscopy of new 4f chiral magnet

23AG015 Hitoshi Sato: Hiroshima Synchrotron Radiation Center, Hiroshima University
Study on spin texture of new 4f chiral magnet $Yb(Ni_{1-x}Cu_x)_3Al_9$

23AG016 Meng Wang : CEMS, RIKEN
XAS and XMCD study of the magnetic states in $RuO_2/CoFe_2O_4$ and $IrO_2/CoFe_2O_4$ interface

23AG017 Yasuyuki Maki : Faculty of Science, Kyushu University
Effect of glucose on the thermal stability of proteins

23AG018 Shinjiro Hayakawa : Graduate School of Advanced Science and Engineering, Hiroshima University
Ca K-edge EXAFS spectroscopy and in situ observation of phase transformation among calcium carbonate polymorphs

23AG019 Takayoshi Yokoya : Research Institute for Interdisciplinary Science, Okayama University
Electronic structure study of functional materials at BL-5 (FY2023 A)

23AG020 Akari Takayama : Faculty of Science and Engineering, School of Advanced Science and Engineering, Waseda University
Topological proximity effect in Sb/Bi heterojunction studied by spin-resolved ARPES

23AG021 Shilong Wu : Institute of Physics, Chinese Academy of Sciences
High resolution ARPES study of type IV Dirac band structures in superconducting SrAgBi

23AG022 Guodong Liu : Institute of Physics, Chinese Academy of Sciences
A study on the topological nature of superconductor SnAs by using high-resolution ARPES

23AG023 Guodong Liu : Institute of Physics, Chinese Academy of Sciences
A study on the nature of correlated Flat band and 2D Dirac fermions in the magnetic kagome metal FeSn by using spin-resolved ARPES

23AG024 Baojie Feng : Institute of Physics, Chinese Academy of Sciences
Exploration of flat bands in low-dimensional tellurides

23AG025 Baojie Feng : Institute of Physics, Chinese Academy of Sciences
ARPES study of a candidate Weyl semimetal

23AG026 Zhang Ke : University of Electronic and Technology of China (UESTC)
Revealing the band structure of emerging superconducting nickelates $La_{0.8}Sr_{0.2}NiO_2$ and $Nd_{0.8}Sr_{0.2}NiO_2$ by high resolution ARPES

23AG027 Hikaru Yabuta : Graduate School of Advanced Science and Engineering, Hiroshima University
Structural analysis of prebiotic depsipeptides by circular-dichroism spectroscopy

23AG028 AVERLANT-PETIT Marie Christine : Unversité de Lorraine/CNRS
Structural and conformational studies of peptide-based hydrogels: influence on self-assembling

23AG029 Masahiro Sawada : Hiroshima Synchrotron Radiation Center, Hiroshima University
Magnetic coupling between transition metals through monolayer hexagonal boron nitride

23AG030 Kenta Kuroda : Graduate School of Advanced Science and Engineering, Hiroshima University
Study of topological electronic structures in atomic-layer magnetic thin films

23AG031 Kenta Kuroda : Graduate School of Advanced Science and Engineering, Hiroshima University
Systematic investigations of many-body interaction in low-carrier rare-earth monopnictides

23AG032 Kenta Kuroda : Graduate School of Advanced Science and Engineering, Hiroshima University

Study of spin-orbit coupled electronic structures in antiferromagnets

23AG033 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology

Observation of nuclear creation process of liquid-liquid phase separation using VUV-CD spectroscopy

23AG034 Friedrich Reinert : Universitäet Wüerzburg

Mapping the pseudospin texture in a Kagome superconductor by means of dichroic ARPES

23AG035 Friedrich Reinert : Universitäet Wüerzburg

Electronic structure and spin texture of a Tellurium Kagome monolayer grown on Pt(111)

23AG036 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University

Trial to control the anisotropy of topological surface states

23AG037 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University

Temperature and substrate dependence of magnetic anisotropy of O/FeCo(001)film on Pd(001)

23AG038 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University

Topological electronic states induced by external perturbation (pressure and electric current)

23AG039 Jayita Nayak : Indian Institute of Technology Kanpur

Band structure investigation of RAlX (R: Ce, Pr, Nd, La; X: Si or Ge) semimetals

23AG040 Masashi Arita : Hiroshima Synchrotron Radiation Center, Hiroshima University

Observation of Electron Correlation Effects in MnSi by ARPES

23AG041 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University

Exploration of spin-polarized topological band structures in ferrimagnetic Mn based alloys

23AU001 Hideaki Iwasawa : National Institutes for Quantum and Radiological Science and Technology

Application of measurement informatics on spin-resolved ARPES experiments

23AU002 Shilong Wu : Institute of Physics, Chinese Academy of Sciences

Laser-spin-ARPES study of spin-polarized Fermi arcs in a Weyl semimetal superconductor

23AU003 Alexander Shikin : Saint-Petersburg state university

Study of modification of electronic structure of $MnBi_2Te_4$ under doping with low concentrations of Pb, Ge, Sn, Si depending on the temperature and polarization of laser radiation to analyze changes in their magnetic properties

23AU004 Masahiro Kobayashi : National Institute for Fusion Science

Circular dichroism analysis of molecular structure in amino acid specimen by vacuum-ultraviolet circularly-polarized light irradiation

23AU005 Tomohide Saio : Institute of Advanced Medical Sciences, Tokushima University

Molecular Mechanism of Chaperone Action Characterized by Time-Resolved Vacuum-Ultraviolet Circular Dichroism Spectroscopy

23AU006 Masato Sakano : School of Engineering, The University of Tokyo

Observation of characteristic spin texture in few-layer WTe_2

23AU007 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University

Laser ARPES on new 4f chiral magnet $YbNi_3Al_9$

23AU008 Ken Terao : Graduate School of Science, Osaka University

Destabilization mechanism of triple helical structure of collagen upon complexation with nanoparticles

23AU009 Alexander Shikin : Saint-Petersburg state university

Modification of electronic spin structure of MnBi2Te4 doped with Pb at different concentrations for analysis of interaction between topology and magnetism

23AU010 Pramod Bhatt : Bhabha Atomic Research Centre Mumbai India

Soft X-ray Absorption Spectroscopy (XAS) Study of Vanadium Hexacyanoferrate Based Open Framework Compound

23AU011 Jun Maruyama : Osaka Research Institute of Industrial Science and Technology

Determination of chirality at nanopore arrangement in needle-like carbon
23AU012 Alexander Shikin : Saint-Petersburg state university
Modification of the spin structure of $Ge(Pb)_xMn_{1-x}Bi_2Te_4$ at the topological phase transitions
23AU013 Turgut Yilmaz : University of Connecticut
Investigating the semimetal phase in $TiSe_2$
23BG001 Chang Liu : Southern University of Science and Technology
Evolution of electronic structure of itinerant-moment magnetic phase transition in the $Sr_{1-x}Ca_xCo_2P_2$ system
23BG002 Chang Liu : Southern University of Science and Technology
Probing a new type of SOC-independent, momentum-dependent spin splitting effect in antiferromagnets
23BG003 Ken Terao : Graduate School of Science, Osaka University
Dissociation-association dynamics of double helices of the multi-helical polymer xanthan in aqueous solution
23BG004 Taichi Okuda : Hiroshima Synchrotron Radiation Center, Hiroshima University
Verification of chirality induced spin selectivity effect (CISS effect) in self-assembled chiral polymers on gold surface
23BG005 Hiroyuki Ikemoto : Department of Physics, University of Toyama
Electronic state of the chalcogen chains encapsuled in carbon nanotubes
23BG006 Mark Edmonds : Monash University
Understanding the spin-texture of the topological Dirac and flat bands in ultra-thin Kagome metal Mn_3Sn
23BG007 Kouji Miyamoto : Hiroshima Synchrotron Radiation Center, Hiroshima University
Thickness-dependent electronic structure as the origin of the intrinsic spin Hall effect in Pt(001) thin film
23BG008 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
Observation of nuclear creation process of liquid-liquid phase separation using VUV-CD spectroscopy
23BG009 Kentaro Fujii : National Institutes for Quantum and Radiological Science and Technology
Analysis of antibody-drug conjugate in tumor cells utilizing synchrotron soft X-ray spectroscopy
23BG010 Ryota Akiyama : Graduate School of Science, The University of Tokyo
Investigation of the band dispersion in Yb-intercalated graphene
23BG011 Shin-ichiro Ideta : Hiroshima Synchrotron Radiation Center, Hiroshima University
ARPES study of the electronic structure on underdoped triple-layer cuprate
23BG012 Shin-ichiro Ideta : Hiroshima Synchrotron Radiation Center, Hiroshima University
Role of charge fluctuations on the electronic structure of cuprates observed by ARPES
23BG013 Marie Christine Averlant-Petit : Unversité de Lorraine/CNRS
Structural and conformational studies of peptide-based hydrogels: influence on self-assembling
23BG014 Jayita Nayak : Indian Institute of Technology Kanpur
Search for novel quantum states in axion insulators
23BG015 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Origin of superconductivity in Dirac nodal-line materials with P square-net
23BG016 Takayoshi Yokoya : Research Institute for Interdisciplinary Science, Okayama University
Synchrotron ARPES of nodal line semimetal candidate $LaTe_{1+x}Bi_{1-x}$
23BG017 Chaoyu Chen : Southern University of Science and Technology
Investigation of c-f hybridization in Quasi-1D Kondo lattice $CeCo_2Ga_8$ and $CeCo_2Al_8$
23BG018 Chaoyu Chen : Southern University of Science and Technology
ARPES study on magnetic hourglass candidate $CsMn_2F_6$
23BG019 Chaoyu Chen : Southern University of Science and Technology
Enhanced spin polarization of the surface state protected by non-symmorphic symmetry
23BG020 Chaoyu Chen : Southern University of Science and Technology

Spin-resolved ARPES study on altermagnet candidate $V_{1/3}NbS_2$
23BG021 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University
Angle resolved photoemission spectroscopy of reference material for new 4f chiral magnet $YbNi_3Al_9$
23BG022 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University
Angle resolved photoemission spectroscopy of LuNi3Al9; Comparison of band structure of new 4f chiral magnet $YbNi_3Al_9$
23BG023 Hitoshi Sato : Hiroshima Synchrotron Radiation Center, Hiroshima University
Study on spin texture of new 4f chiral magnet $YbNi_3Al_9$
23BG024 Chaoyu Chen : Southern University of Science and Technology
Investigation of electronic structure and possible chiral CDW state in the natural hetero-structure material 6R-TaS_2
23BG025 Minoru Iwata : Kyushu Institute of Technology
Design of optical glass for evaluation of UV degradation through on-orbit exposure experiments
23BG026 Masahiro Hara : Graduate School of Science and Technology, Kumamoto University
Effects of Ar ion irradiation on anatase nanoparticles converted from titanium oxide nanosheets
23BG027 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Observation of nodal-links and spin-polarized surface states in Heusler-type ferromagnets
23BG028 Akio Kimura : Graduate School of Advanced Science and Engineering, Hiroshima University
Maximization of anomalous Nernst effect in Fe based ferromagnetic alloy films
23BG029 Jens Ruediger Stellhorn : Department of Physics, Nagoya University
Structure of Tsai-type M-In-Yb quasicrystals by low-energy X-ray spectroscopy
23BG030 Jayita Nayak: Indian Institute of Technology Kanpur
Band structure engineering of magnetic Weyl semimetals
23BG031 Jimin Kim : Max Planck Pohang University of Science and Technology
Investigating charge density wave and Kondo lattice behavior of cerium tellurides
23BG032 Jimin Kim : Max Planck Pohang University of Science and Technology
Investigating pseudogap and broken time-reversal symmetry phases from the momentum-resolved electronic structures of kagome metal, ScV_6Sn_6
23BG033 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University
Electronic relaxation dynamics depending on molecular conductivity probed by electron spectroscopy II
23BG034 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University
Soft X-ray spectroscopy of phospholipid membranes supported by self-assembled monolayers
23BG035 Shin-ichi Wada : Graduate School of Advanced Science and Engineering, Hiroshima University
X-ray absorption spectroscopy of functional organic molecules assembled metal nanoparticles made by laser ablation
23BG036 Dmitry Estyunin : Saint-Petersburg State University
Topological phase transition in the $MnBi_2Te_4$-based compounds
23BG037 Shinya Hosokawa : Institute of Industrial Nanomaterials, Kumamoto University
Conduction-band electronic states of Dy-TM metallic glasses having thermal rejuvenation effect
23BG038 Shinya Hosokawa : Institute of Industrial Nanomaterials, Kumamoto University
Valence-band electronic states of Dy-TM metallic glasses having thermal rejuvenation effect
23BG039 Shilong Wu : Songshan Lake Materials Laboratory
Unveiling the Dresselhaus-type spin texture by SR-based spin-ARPES
23BG040 Masashi Arita : Hiroshima Synchrotron Radiation Center, Hiroshima University
ARPES study of strain-induced phase transitions in $Pb_{1-x}Sn_xTe$ and 1T-TaS_2
23BG041 Baojie Feng : Institute of Physics, Chinese Academy of Sciences

ARPES study of the phase transition in a low-dimensional telluride

23BG042 Baojie Feng : Institute of Physics, Chinese Academy of Sciences

ARPES study of the band structure of iron nitride

23BU001 Subham Majumdar : Indian Association for the Cultivation of Science

X-ray magnetic circular dichroisrn (XMCD) study in Fe doped Cr_2 GeC

23BU002 Yasuyuki Maki : Faculty of Science, Kyushu University

Effect of sugar and sugar alcohol on the thermal stability of protein

23BU003 Alexander Shikin : Saint-Petersburg State University

Modification of electronic and spin structure of $Ge(Pb)_xMn_{1-x}Bi_2Te_4$ at the topological phase transitions

23BU004 Masahiro Kobayashi : National Institute for Fusion Science

Circular dichroism analysis of optical activity in amino acid specimen by polarized quantum beam irradiation

23BU005 Tetsuji Sekitani : Graduate School of Advanced Science and Engineering, Hiroshima University

NEXAFS study of polymer/fullerene blend films

23BU006 Kazuki Sumida : Hiroshima Synchrotron Radiation Center, Hiroshima University

Spin-polarized electronic structure of carrier-tuned topological insulators

23BU007 Koichiro Yaji : National Institute for Materials Science

Electronic structure of multilayer graphene on ferromagnetic substrate

23BU008 Daniel S Dessau: University of Colorado Boulder

Laser spin-ARPES of topological materials

23BU009 Koichi Matsuo : Hiroshima Synchrotron Radiation Center, Hiroshima University

Conformation change of Magainin2 depending on the spontaneous curvature of membrane

23BU010 Shin-ichiro Ideta : Hiroshima Synchrotron Radiation Center, Hiroshima University

Role of charge fluctuations on the electronic structure of cuprates observed by IPES