



Preface

This Activity Report covers scientific and technological activities carried out using the UVSOR-III Synchrotron in FY2019 (April 2019 - March 2020). We present scientific examples of how the users study at the UVSOR Synchrotron Facility.

The present UVSOR-III Synchrotron is one of the most advanced low-energy SR facilities of the 3rd generation SR in the world and is now one of the critical resources in doing molecular science. The UVSOR-III Synchrotron

has a small electron storage ring but has powerful 6-undulator beamlines (3 VUV and 3 in-vacuum soft X-ray undulators) with 8-dipole beamlines. We never stop improving and upgrading our micro- and nano-scale photoabsorption and photoemission approaches and in situ/operando measurements in the VUV and soft X-ray regions, based on our strategic international collaboration program in molecular science. We are grateful to all the people who use our facility and support our efforts.

UVSOR operates for 40 weeks/year (ca. 2,200 h user time), accepts ~220 proposals, about 1,300 researchers meaning ca. 100 people/beamline and ca. 30 people/week. Most users stay for one or two weeks for doing the experiment. To continue high-level achievements in science and technology at the UVSOR-III Synchrotron, our in-house staff is constantly committed to maintaining and improving high-performance accelerators and beamlines. The FY2020 would be a challenging year for all researchers, and COVID-19 issues will have a major impact on synchrotron users around the world. We decided to operate the UVSOR as planned after completing



the scheduled maintenance weeks, however the most of users may not come to the experiments at UVSOR because of limitation of the working activity by COVID-19. Considering the situation, it was decided to allocate a beamtime to the second half period by transferring the same project approved in the first half period with or without beamtime cancellation.

In terms of personnel, an associate professor, Yoshitaka Taira, joined to UVSOR from April 2020. We hope he will spice up some of the uniqueness of our facility, that is, a development and utilization of novel quantum beam sources as like gamma-ray related experiments dedicated at the beamline BL1U.

On the experimental side, technology development will not stop, hence we will make a progress on the imaging-related techniques to inspire the advanced molecular science. We have started to construct the new endstation at the undulator-based soft X-ray beamline BL6U. The new apparatus is based on the momentum-resolved photoelectron emission microscopy and spectro-microscopy, we call it “photoelectron momentum microscope”. The project will be developed by three steps, and in the end the novel function will be uniquely added to our apparatus to keep future developments ranging for 10-15 years in the UVSOR Synchrotron Facility. The advanced SR-related instrument will offer opportunities in characterizing the electronic structure of surface atomic sites, thin films, molecular adsorbates, bulk crystals, and so on.

We look forward to receiving your feedback and suggestions on the continuing evolution of the UVSOR Synchrotron Facility. And we hope many users will perform excellent work by fully utilizing the UVSOR-III Synchrotron as a unique international hub for the SR research in advanced molecular science.

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Satoshi Kera

Director of the UVSOR Synchrotron Facility