

RIKEN Beamlines

1. Introduction

RIKEN SPring-8 Center (RSC) is responsible for the R&D of SPring-8 and SPring-8-II (coming in the future) beamline technologies and application systems and the new SACLA technologies in various fields of synchrotron radiation (SR) science. The RIKEN Advanced Photon Technology Division explores the best use of the highly brilliant SR sources of SPring-8 and XFEL of SACLA in diverse scientific fields, from life science to materials science, mainly based on the RIKEN beamlines.

2. Recent activities

We are responsible for the operation and user support of the RIKEN beamlines currently in operation. Four structural biology beamlines, six physics and chemistry research beamlines, and two R&D beamlines are in operation, and the technical development and synchrotron radiation experiments for new synchrotron radiation use and SPring-8-II are progressing smoothly. In FY2023, user utilization of SPring-8 recovered to almost the same level as before COVID-19. The development and use of remote experiment systems and automated beamline measurement systems have been further promoted at the beamlines since FY2020, and the experimental configuration of SPring-8 beamlines has changed significantly as a result of the R&D of the RIKEN beamline.

RIKEN beamlines are conducting various R&D under the SPring-8-II project. At the R&D

beamline (BL05XU), applications are being developed for the utilization of high-energy X-rays, such as a radial distribution function measurement system under high temperature and high pressure using a 100 keV high-energy pink beam with a double multilayer monochromator (DMM).

At the macromolecular crystallography (MX) beamlines, a fully automated data acquisition pipeline, the ZOO system, has become the mainstream method to improve user convenience and the utilization of analysis data. Almost all SPring-8 MX users have obtained high-quality structural analysis data without visiting the SPring-8 facility. In addition, the development of structural dynamics research using high-data-rate MX based on the vast amount of structural analysis data acquired by the ZOO system is underway.

In addition, we are participating in a number of national projects, such as the AMED/BINDS project for drug discovery research at the Structural Biology Beamline and the NEDO PEFC project for fuel cell development at BL36XU and cooperating to promote cutting-edge research.

In the next section, we report on the present status of the RIKEN beamlines.

YAMAMOTO Masaki

Advanced Photon Technology Division, RIKEN
SPring-8 Center