Preface

We thank our SPring-8 and SACLA teams for delivering stable facility operations with minimal downtime in 2022. Despite a sharp rise in energy costs due to the Ukrainian War, we maintained the same level of operating hours as in prior years by changing the injector implemented in the previous year and tapping into the supplementary budget. Making our facility more energy-efficient is becoming paramount. The budget for fiscal 2023 was approved at the same amount as for the previous year. Since the budget does not account for the increase in electricity costs, we had to find ways to reduce other costs by 10%. We thank everyone who responded to this challenging request.

We continue to face the deterioration of our aging facility infrastructure. We are working on an updated modernization plan that aligns the required changes in the facility infrastructure to modifications required for the SPring-8-II upgrade.

The reorganization of public beamlines is progressing smoothly. Since the upgrade of SPring-8-II will require substantial changes, such as adjustments to the undulator due to the decrease in stored electron energy, we have started discussions with the dedicated beamline installers about how to accommodate these changes. In addition, we are preparing to replace the delivery mechanism that supplies liquid nitrogen for cooling optical elements. International shortages of semiconductors and other materials due to disruptions in the supply chain have significantly impacted the maintenance and management of beamlines and accelerators. These material shortages are gradually being eliminated.

We recently completed the X-ray detector (CITIUS), which has been under development for several years, and started testing at the beamline. Achieving the expected performance will open up new possibilities for X-ray measurement. Last year, we built a new data center to accommodate the increase in data volumes due to the progress of detectors.

SPring-8 has supported the construction of the NanoTerasu accelerator. By the end of 2022, the hardware installation was almost complete. In the next fiscal year, start-up work will be carried out to prepare for operations at the beginning of fiscal 2024. In addition, we are cooperating with trial use

projects that Sendai City and the Tohoku Bureau of Economy, Trade, and Industry are carrying out to help NanoTerasu users gain relevant experience at SPring-8. We are also providing support in a number of ways for beamline construction by PhoSic and QST.

To support Japan's semiconductor strategy, we plan to establish a semiconductor characterization platform by constructing a beamline using funds provided by the Ministry of Economy, Trade, and Industry. This will enable us to measure the degree of deterioration of social infrastructure in response to the national resilience plan and develop technology to predict future trends from the resulting data. The SYNAPSE project, a life science application, is underway in collaboration with synchrotron radiation facilities in Asia and Oceania to visualize in 3D the whole-brain synaptic connections in primates. Furthermore, at the request of JICA, we agreed to support the construction of a fourth-generation synchrotron radiation facility in Thailand. We recognize that this is a significant example of advanced science and technology infrastructure exports that exceed those of the past.

Regarding the SPring-8-II upgrade, we have continued to make intensive efforts, with significant progress since the beginning of 2023. We expect this topic to be the focus of our next annual report.

ISHIKAWA Tetsuya, Dr. Eng.
Director, RIKEN SPring-8 Center