

Council for Science and Technology, Subcommittee on Quantum Beam Science and Technology

Outline of the Report on the Development of SPring-8-II and the Future of Japan's Synchrotron Radiation Facilities

Point

As a result of discussions and deliberations at the Quantum Beam Science Research Subcommittee, it was decided that **it is necessary to start construction of SPring-8-II as soon as possible** in order to make it the world's most brilliant synchrotron radiation facility, approximately 100 times brighter than the current facility.

Results of discussions and reviews

1. The need to immediately improve the development and utilization environment of SPring-8-II

- As the world moves towards the fourth generation of hard X-ray synchrotron radiation facilities, **the third-generation SPring-8 will become obsolete, posing a major challenge from the perspective of economic security.** Furthermore, **maintenance costs are increasing year by year owing to aging, and renewal costs will also be incurred.** For this reason, **SPring-8 will be upgraded to a fourth-generation synchrotron radiation facility as soon as possible.**
- To maximize the value of SPring-8-II and continue to meet the changing needs of users, **we will continually update the usage system, including the setting of usage fees.**
- **SPring-8-II will lead future industries, such as the mass production of next-generation semiconductors and the realization of a GX society, which will be in full swing by 2030,** and will be an important basic facility to support the sustainable development of Japan's national strength and people's lives.
- Since **SPring-8 is the flagship synchrotron radiation facility in Japan, SPring-8-II should be realized as a national project as soon as possible.**

2. SPring-8-II technical goals and development period

- **Aiming to achieve world-leading performance with a maximum brightness approximately 100 times that of the current SPring-8, the facility will introduce fourth-generation accelerator technology and energy-saving technologies.**
- Taking advantage of previous examples from other countries and the knowledge gained from the construction of NanoTerasu, **SPring-8-II will be developed over a four-year period, including a shutdown period of approximately one year.**
- In parallel with the development of SPring-8-II, **we will continue to work on breaking through technological limitations with an eye toward fifth-generation synchrotron radiation facilities.**

3. Improving the user environment for SPring-8-II

- Promote utilization through three pillars: traditional bottom-up industrial utilization and academic utilization plus top-down strategic utilization and updating of the utilization system in accordance with user needs.
- To improve the efficiency of data acquisition and respond to the increase in data volume, we will proceed with updating the data center usage system.
- To expand use by industry, including small- and medium-sized enterprises, we will strengthen cooperation with public research institutes and neighboring municipalities and advance efforts to form a public research institute network and expand the corporate version of hometown tax donations.
- The fee system will be updated to bring it in line with the times so that in addition to recovering operating costs, beneficiaries can also pay a fee commensurate with the value the facility provides.

4. Other matters

- To conduct public relations aimed at potential users and the general public, we will clarify the targets and carry out effective public relations for each of them.
- To foster and exchange human resources in the field of synchrotron radiation, it is necessary to consider the most appropriate approach for each university, company, and other institutions, and for each institution to cooperate with each other.
- The Subcommittee will address issues raised by domestic synchrotron radiation facilities, such as the need for a mechanism to enable seamless coordination among quantum beam facilities and a forum to discuss the future of synchrotron radiation facilities at the policy level.

To include this material in the 2023 SPring-8/SACLA Annual Report, the SPring-8 Center Promotion Office, RIKEN, has prepared a tentative English translation with permission from the Ministry of Education, Culture, Sports, Science and Technology. The original text (in Japanese) can be viewed on the Ministry of Education, Culture, Sports, Science and Technology's website at the URL below.

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SPring-8 Center Promotion Office, RIKEN