

Chapter 1 Introduction

SPring-8 celebrated its 10th anniversary in 2007 to enter the second decade of its operation.

The SPring-8 facility was designed and constructed by the Japan Atomic Energy Research Institute (JAERI) (presently, Japan Atomic Energy Agency (JAEA)) and the Institute of Physical and Chemical Research (RIKEN). Since its inauguration in October 1997, Japan Synchrotron Radiation Research Institute (JASRI) has been operating the facility and supporting public user programs. In October 2005, JAEA withdrew from the management of SPring-8 and the present administrative structure by RIKEN and JASRI was organized.

As of August 2008, 47 beamlines are in operation for experiments, and among them, 26 beamlines are open for public users under the JASRI's management. The other beamlines are managed by RIKEN or other institutions mainly for their own research, and their details are shown in Chapter 2. The state-of-the-art instruments in the beamlines, some of which are available only in a limited number of synchrotron radiation facilities worldwide, are shared among the communities of basic science and industry, and recently, more than 14,000 users have visited SPring-8 in a year.

One of the remarkable achievements in the first decade is routine top-up operation. An extraordinarily constant current with a fluctuation of 3×10^{-4} has been achieved, delivering world's most, stable X-ray beams to the experimental stations. This accomplishment has enabled users to perform more reliable experiments and improved the flexibility in the choice of beam-filling modes in the storage ring. In particular, the improved flexibility has encouraged time-domain or time-resolved studies.

Another noteworthy outcome is the expansion of industrial use. Nearly 300 proposals are submitted from industries nowadays and their use has reached about 20 % of the total user beamtime. This success is mostly due to enhanced staffing, propulsion programs and new dedicated beamlines. SPring-8 implemented two utilization propulsion programs: Trial-Use Program (FY2001-FY2005) and the Strategic Use of Advanced Large-Scale Research Facilities Program (FY2005-FY2006). As of 2008, three public beamlines and three contract beamlines run for industrial use.

Currently, the 8-GeV X-ray Free Electron Laser (XFEL) facility is being constructed by RIKEN and JASRI, and its completion should be one of the remarkable accomplishments in the second decade. In the near future, the SPring-8 storage ring and XFEL facilities will run with the benefits of synergy in the SPring-8 campus. Along this line, SPring-8 has initiated discussion on its radical upgrade of the storage ring that will enable users to carry out world's leading research in the second and third decades.

This book is compiled to show the outline of SPring-8 to the SPring-8 Academic Review Committee (SPARC). In the next chapter, the current status of the SPring-8 beamlines is described. Chapters 3 and 4 show the storage ring and user operations, respectively. Chapter 5 presents the statistics of publications from all beamlines. Appendix A shows a summary of the experimental stations and Appendix B shows a list of the publications.