

7. Industrial Use

1. Overview

Industrial application is an important mission for SPring-8. The public and contract beamlines of SPring-8 are utilized for industrial applications in various fields. Here, the status of industrial applications at the public beamlines of SPring-8 in FY2022 is reported. In FY2022, 132 companies conducted experiments in SPring-8, and 118 used public beamlines. The number of approved proposals of company users at public beamlines was 320. This was about 107 % of that in FY2021. These approved proposals of industrial users accounted for 19 % of all approved proposals at public beamlines (Fig. 1). Furthermore, 77 % of the approved proposals of industrial users were proprietary proposals. This demonstrates that the experiments conducted at SPring-8 are useful and effective for industrial research and development among company users.

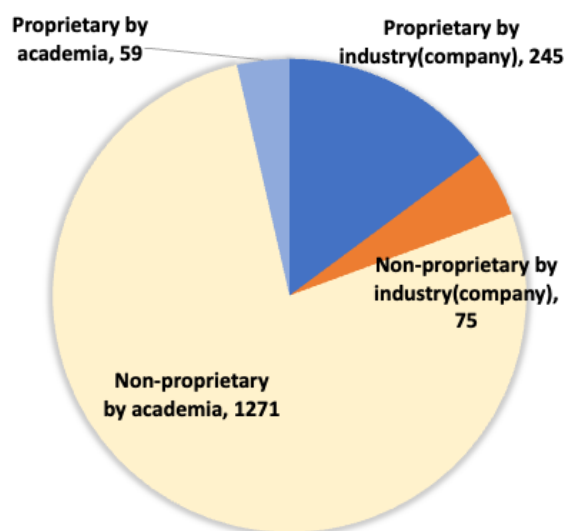


Fig. 1. Number of approved proposals at public beamlines in FY2022, categorized by the organization of the project leader.

In FY2022, some usage systems concerning industrial use were changed. There are six annual calls for proposals and feasibility study proposals for industrial applications. The former ones call for proposals six times per year and are aimed to meet demands that company users use SPring-8 flexibly to suit their business schedules. The latter ones are proprietary proposals for feasibility study in a short machine time and can be submitted at any time; these are aimed at improving the efficiency of experiments for challenging themes. They were carried out only in three Engineering Science Research beamlines: BL14B2, BL19B2, and BL46XU. However, in FY2022, the number of beamlines acceptable for submission of proposals in these usage systems was increased. The six annual calls for proposals began to be carried out in nine beamlines in 2022B. The feasibility study proposals for industrial applications, the name of which was changed to proprietary time-designated proposals with hour-based beamtime use, began to be carried out in 22 beamlines in 2022A. Furthermore, the acceptable general proposals in the three Engineering Science Research beamlines, which were limited only to those reviewed by the review subcommittee for industrial application (called “general proposals for industrial application), were extended to those reviewed by other review subcommittees for academia in 2022B. Along with this change, the names of the three Engineering Science Research beamlines were changed as follows: BL14B2 XAFS II, BL19B2 X-ray Diffraction and Scattering II, and BL46XU HAXPES II. The background is that the usages by company users have expanded to beamlines other

than the Engineering Science Research beamlines, with the purpose of promoting the industrial application of SPring-8, as shown in Fig. 2. This is thought to demonstrate that industrial use has been established in SPring-8. Therefore, the usage system suitable for industrial application was extended to beamlines other than Engineering Science Research beamlines in order to further stimulate industrial application of the entire public beamlines in SPring-8. Furthermore, the use of the Engineering Science Research beamlines was open to academic users in response to the recent increase in academic users' desire to use the Engineering Science Research beamlines.

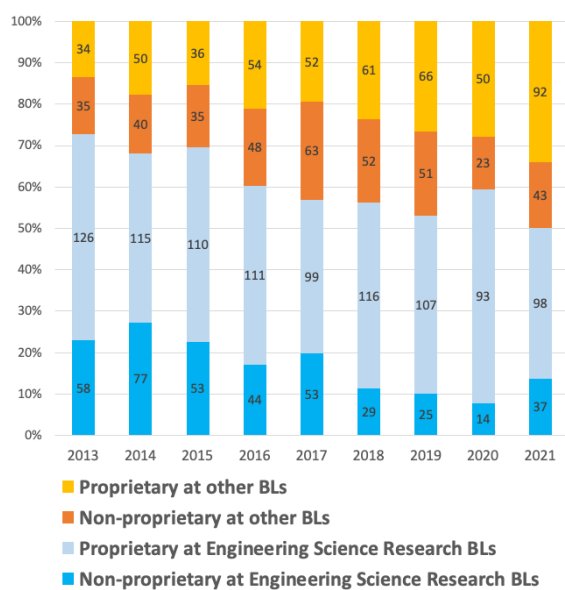


Fig. 2. Annual trends in the ratio of the number of proposals carried out by industrial users at Engineering Science Research BLs to that at other BLs in the period from FY2013 to FY2021. The numbers in bars are the number of proposals.

2. General proposals for industrial applications

General proposals for industrial applications are non-proprietary proposals reviewed by the review

subcommittee for industrial application, as mentioned above. The review of these proposals has focused particularly on industrial significance. Academic users can submit these proposals, but the project team must include at least one person employed by a private company. In FY2022, 89 of the 153 submitted proposals were approved. The number of submitted proposals is about 65 % of that in FY2021. The reasons are considered to be as follows: 1) from 2022B, it became possible for academia users of the three former Engineering Science Research beamlines to submit proposals reviewed by review subcommittees other than those for industrial applications, 2) the usages of company users have become mainly proprietary. This trend is expected to continue in the future, but general proposals for industrial application should continue to be important for acquiring new industrial applications of SPring-8.

3. Measurement services

Applications for measurement services are accepted at the Engineering Science Research beamlines as proprietary proposals. In these services, users send in their samples, and beamline staff conduct the measurements. The beamtime is provided in 2-hour increments. Users can submit proposals up to two weeks prior to the scheduled dates for measurement services. Because of these features, measurement services are useful for company users. Services include measurements by XAFS (BL14B2), powder diffraction (BL19B2), SAXS (BL19B2), and HAXPES (BL46XU). In accordance with the measurement service for X-ray diffraction on thin-film samples, in 2022A, the multipurpose 6-axis diffractometer, which has provided this service, was relocated from BL46XU to BL13XU, where this

service is now provided for proprietary time-designed proposals with hour-based beamtime use. In FY2022, 33 % of proprietary proposals carried out by company users at public beamlines were for measurement services (Fig.3).

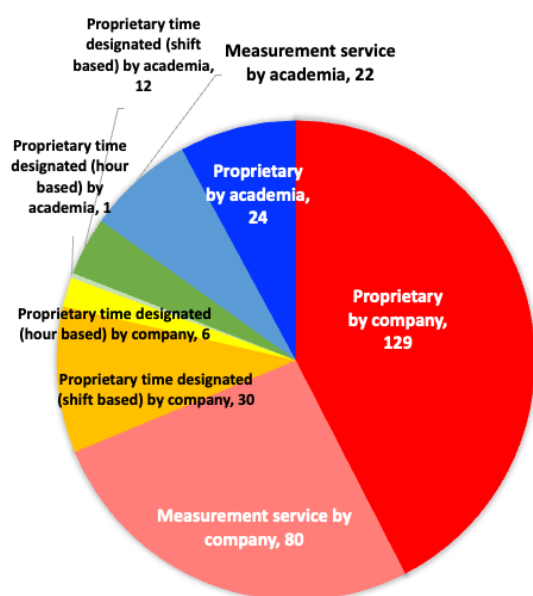


Fig. 3. Number of proprietary proposals carried out at public beamlines in FY2022, categorized by type of proposal and the organization of the project leader.

4. Lectures, workshops, and training for users in industrial application fields

The industrial application division holds lectures, workshops, and training for beginners and potential users in industrial application fields. In FY2022, three lectures on analysis techniques for XAFS and SAXS were held. In addition, there were six workshops on the industrial application of SPring-8 in such fields as electron devices, metals, and catalysis. There were 214 participants at the workshop during “The 19th Joint Conference on Industrial Applications of SPring-8” held on October 31 and September 1, 2022. Training sessions on XAFS were held six times at BL14B2.

Training sessions, one each for powder diffraction and SAXS, were held at BL19B2. One training session for HAXPES was held at BL46XU. One training session for in situ XRD measurement on metal material under tensile testing was held at BL13XU. One training session for X-ray imaging was also held at BL28B2.

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