

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 FY2020 is reported. In FY2020, 115 companies conducted experiments in SPring-8, and 91 used the public beamlines. The number of approved proposals of company users at public beamlines was 199, which was about 80% of that in FY2019. The reason for this decrease should be the effect of suspending user time for countermeasures of COVID-19 from 12th April to 15th June. These approved proposals of industrial users accounted for

18% of all approved proposals at public beamlines (Fig. 1). However, about 8% of these approved proposals of industrials users were canceled mainly due to COVID-19. Over half of all industrial user experiments were performed at the three Engineering Science Research beamlines: BL14B2, BL19B2, and BL46XU (Fig. 2). About 80% of the approved proposals of industrial users were Proprietary Proposals (Fig. 1), and over half of these (about 65%, as shown in Fig. 2) were performed at the Engineering Science Research beamlines. These statistics demonstrate that the experiments conducted at SPring-8 are useful and effective for industrial research and development among company users.

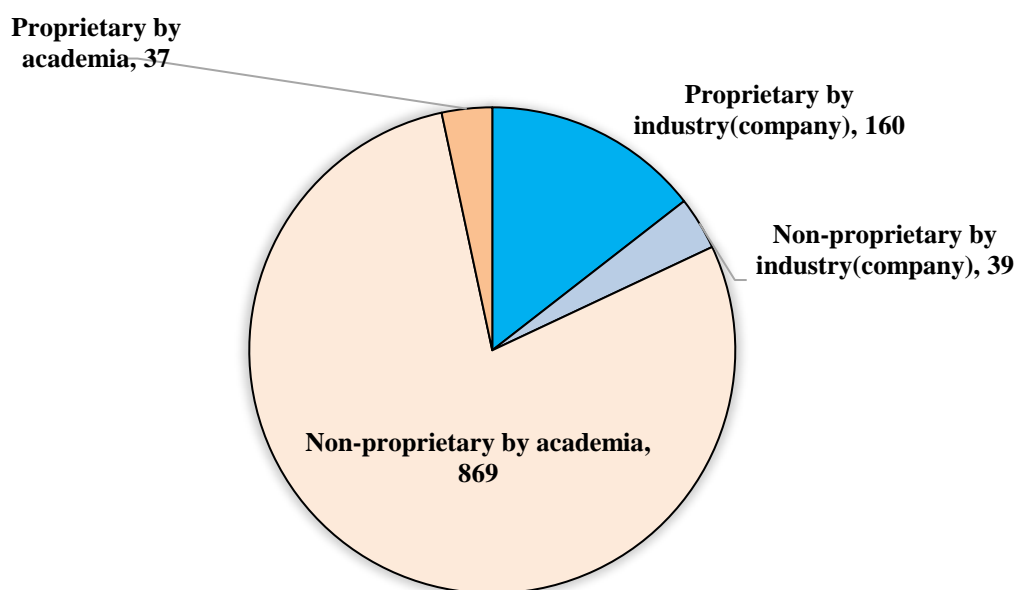


Fig. 1. Number of approved proposals at public beamlines in FY2020 categorized by the organization of the project leader.

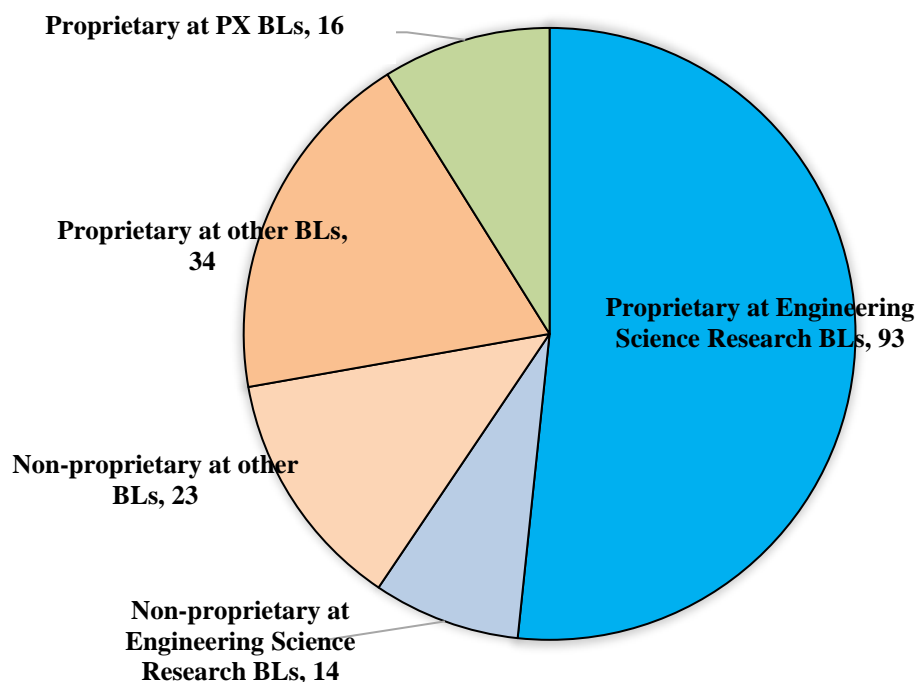


Fig. 2. Number of proposals of industrial users performed at public beamlines in FY2020.

2. General proposals for industrial applications

General proposals for industrial applications are non-proprietary. They require that the project team includes at least one person employed by a private company. Such proposals submitted to the Engineering Science Research beamlines are reviewed six times per year. In FY2020, 144 of the 183 submitted proposals were approved.

3. Measurement services

Applications for measurement services are accepted at the Engineering Science Research beamlines as proprietary proposals. Services include measurements by XAFS (BL14B2), powder diffraction (BL19B2), SAXS (BL19B2), HAXPES (BL46XU), and X-ray diffraction on thin-film samples (BL46XU). In these services, users send

the 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, the measurement services are useful for company users. In FY2020, 58% of proprietary proposals of companies at the Engineering Science Research beamlines were for measurement services (Fig. 3).

4. Feasibility study proposals for industrial applications

Feasibility study proposals for industrial applications were accepted at the Engineering Science Research beamlines as proprietary proposals. These proposals are for the preparation of experiments (e.g., sample check and feasibility

test of experimental techniques). Similar to measurement services, these proposals can commission measurements by beamline staff. Beamtime is allocated by the hour for a maximum of two hours. Proposals can be submitted up to two weeks prior to the scheduled dates for measurements. However, one difference from measurement services is that feasibility study proposals are accepted for all experimental techniques available at the Engineering Science Research beamlines. Feasibility study proposals were established to realize easy-to-implement proprietary proposals and cost reduction. In FY2020, five feasibility study proposals for industrial applications were accepted (Fig. 3).

5. 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 FY2020, one lecture on XAFS analysis was held. In addition, there were three workshops on electron devices, metals, and catalysis. There were 258 participants at the workshop titled, “The 17th Joint Conference on Industrial Applications of SPring-8”, which was held on September 3–4, 2020. Training sessions on XAFS were held four times at BL14B2. Training sessions on powder diffraction and SAXS at BL19B2 were held twice. One training session on GIXD and HAXPES was held at BL46XU.

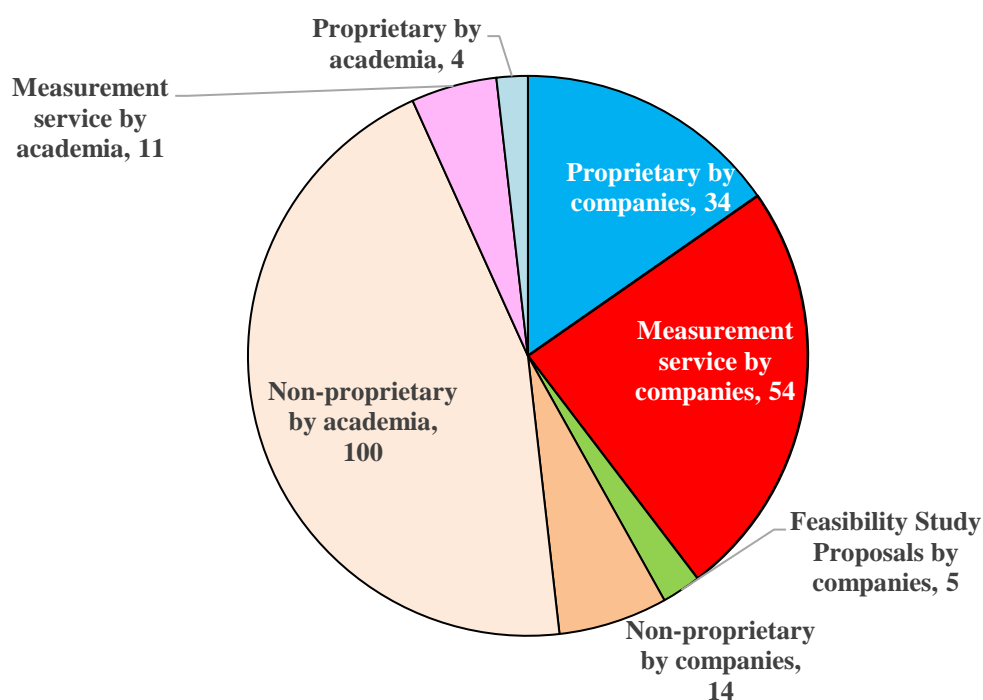


Fig. 3. Number of proposals performed at the three Engineering Science Research beamlines in FY2020, categorized by proposal type and the organization of the project leader.

6. Publications of industrial application fields

The XAFS spectral database of standard samples was published on the SPring-8 website (http://support.spring8.or.jp/xafs/standardDB_02/standardDB.html). In FY2020, 446 XAFS spectra were added to the database. By the end of FY2020, there were 1488 XAFS spectra published. Additionally, there were 79, 47, and 30 peer-reviewed papers published in FY2020 for research at BL14B2, BL19B2, and BL46XU, respectively.

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