

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 FY2021 is reported. In FY2021, 130 companies conducted experiments in SPring-8, and 107 used the public beamlines. The number of approved proposals of company users at public beamlines was 299. This was about 150% of that in FY2020, which was affected by countermeasures to the COVID-19 pandemic. Compared with FY2019, the industrial usage in FY2021 was about 120% of that in FY2019, so it can be seen that the reduction due to the COVID pandemic has been recovered. These approved proposals of industrial users accounted for 18% of all approved proposals at public beamlines (Fig. 1).

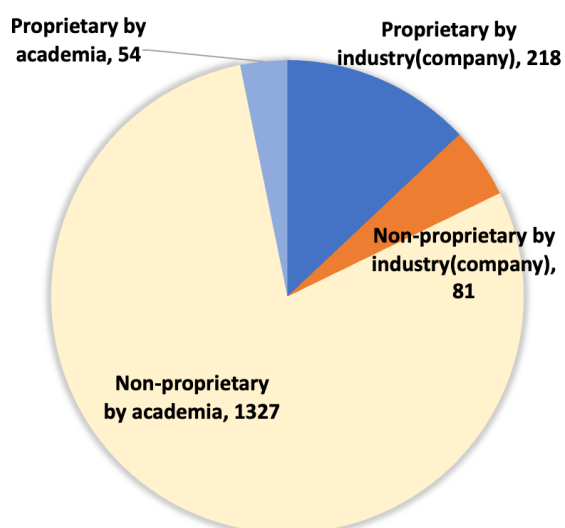


Fig. 1. Number of approved proposals at public beamlines in FY2021 categorized by the organization of the project leader.

About half of all industrial user experiments were performed at the three Engineering Science Research beamlines: BL14B2, BL19B2, and BL46XU (Fig. 2). 73% of the approved proposals of industrial users were Proprietary Proposals (Fig. 1), and about half of these (47%, 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.

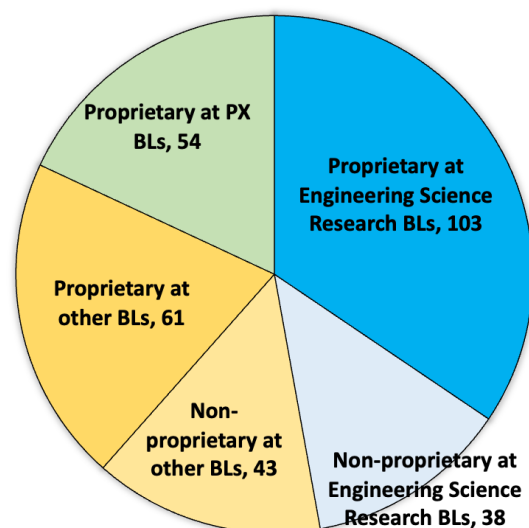


Fig. 2. Number of proposals carried out by industrial users at public beamlines in FY2021.

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 FY2021, 185 of the 236 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 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. In FY2021, 58% of proprietary proposals of companies at the Engineering Science Research beamlines were for measurement services (Fig. 3).

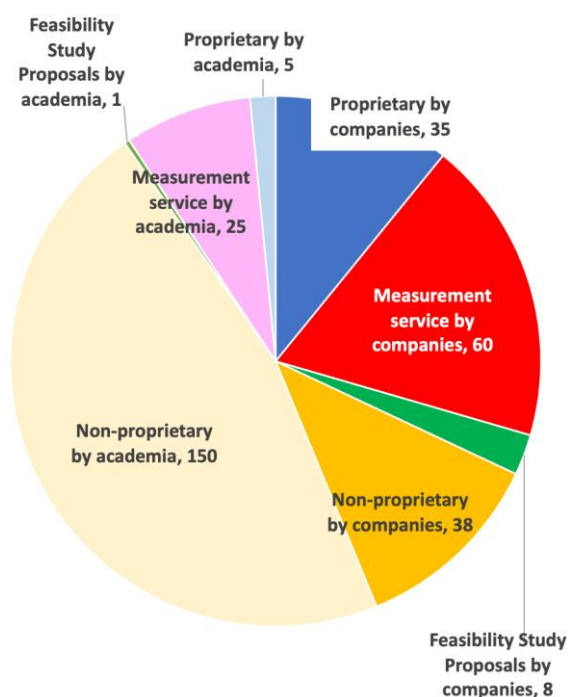


Fig. 3. Number of proposals performed at the three Engineering Science Research beamlines in FY2021 categorized by proposal type and the organization of the project leader.

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 FY2021, eight 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 FY2021, one lecture on XAFS analysis was held. In addition, there were five workshops on electron devices, metals, and catalysis. There were 295 participants at the workshop “The 18th Joint Conference on Industrial Applications of SPring-8” held on September 1–2, 2021. Training sessions on XAFS were held six times at BL14B2. Two training sessions on powder diffraction and one for SAXS were held at BL19B2. Training sessions, one

each for GIXD and HAXPES, were held at BL46XU. One training session for in situ XRD measurement on metal material under tensile testing was also held at BL46XU.

6. Publications of industrial application fields

The XAFS spectral database of standard samples was published on the SPring-8 website (<https://support.spring8.or.jp/BL/bl14b2/xafs/standardDB/index.html>). In FY2021, 116 XAFS spectra were added to the database. By the end of FY2021, there were 1604 XAFS spectra published. Additionally, 68, 51, and 56 peer-reviewed papers on research at BL14B2, BL19B2, and BL46XU, respectively, were published in FY2021.

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