

6. Industrial Use

1. Overview

In FY2019, 121 companies conducted experiments in SPring-8, and 95 used the public beamlines. Of the approved proposals at public beamlines, 16% had project leaders from companies (proposals by industrial users) (Fig. 1). Over half of all industrial user experiments were performed at the three Engineering Science Research beamlines: BL14B2, BL19B2, and BL46XU (Fig. 2). About 70% of the approved proposals by industrial users were Proprietary Proposals (Fig. 1), and over half of these (about 58% 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.

2. General proposals for industrial applications

General proposals for industrial applications are non-proprietary. They require that the project team include 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 FY2019, 165 of the 218 submitted proposals were approved.

3. Priority research program for industrial applications

At the three Engineering Science Research beamlines, cross-SR facility use proposals for industrial applications were conducted as a priority research program. The aim of this program is to produce outputs of SR experiments in industrial application fields using SPring-8 and other SR facilities by considering the characteristics of SR

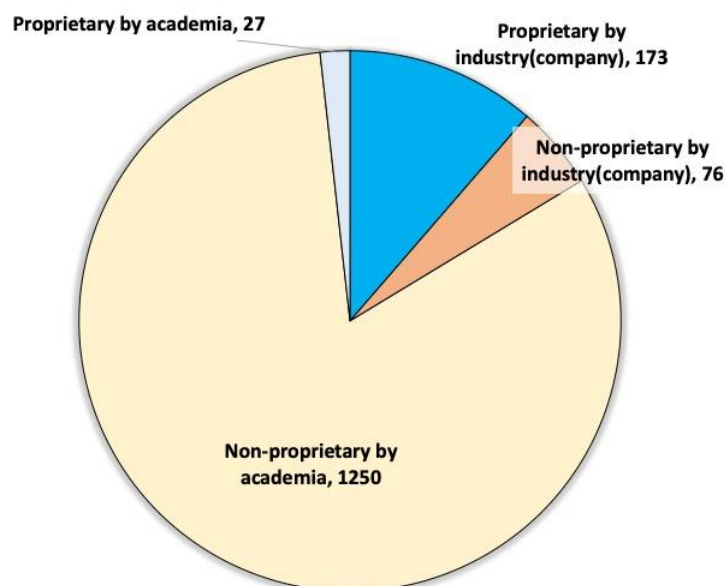


Fig. 1. Number of approved proposals in FY2019 categorized by the organization of the project leader.

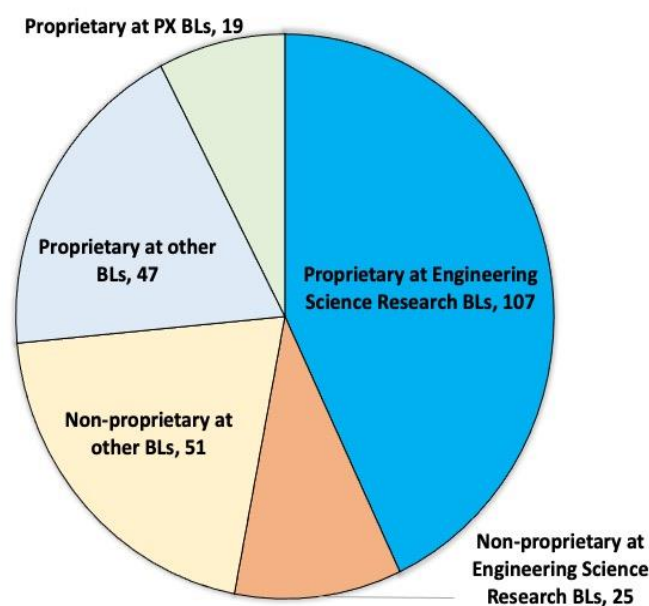


Fig. 2. Number of performed proposals by industrial users at public beamlines in FY2019.

beams. In FY2019, 10 of the 14 submitted priority research proposals were approved and performed.

4. Measurement services

Applications for measurement services are accepted at the Engineering Science Research Beamlines as proprietary proposals. Services include XAFS (BL14B2), powder diffraction (BL19B2), SAXS (BL19B2), HAXPES (BL46XU), and X-ray diffraction on thin-film samples (BL46XU) measurements. 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 the measurement services. Due to these features, the measurement services are useful for company users. In FY2019, 57% of proprietary proposals by companies at the Engineering Science beamlines were for measurement services (Fig. 3).

5. Feasibility study proposals for industrial applications

From 2019A, feasibility study proposals for industrial applications were accepted at the Engineering Science Research Beamlines as proprietary proposals. These proposals are for preparation of experiments (sample check, feasibility test of experimental techniques, etc.). 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 the 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

FY2019, 13 feasibility study proposals for industrial applications were accepted (Fig. 3). Of these, 5 led to applications of proprietary proposals.

6. 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 FY2019, two lectures on XAFS analysis were held. In addition, there were three workshops on electron devices, metals, and catalysis. There were 258 participants at the workshop titled, “The 16th Joint Conference on Industrial Applications of SPring-8”, which was held on September 5–6, 2019. Trainings on XAFS and X-ray imaging were held twice and once at BL14B2, respectively. Trainings on powder

diffraction and SAXS at BL19B2 were held twice and once, respectively. A training on GIXD and HAXPES was held once at BL46XU.

7. 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 FY2019, 157 XAFS spectra were added to the database. By the end of FY2019, there were 1042 XAFS spectra published. Additionally, there were 74, 47, and 41 peer-reviewed papers published in FY2019 for research at BL14B2, BL19B2, and BL46XU, respectively.

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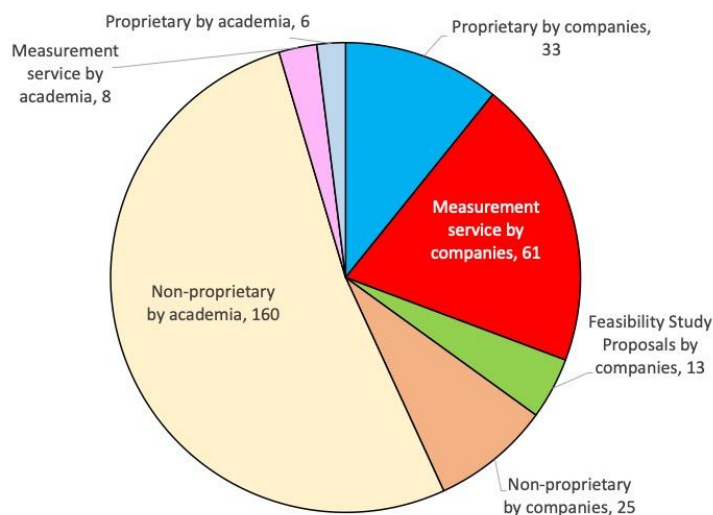


Fig. 3. Number of proposals performed at the three Engineering Science Research beamlines in FY2019 categorized by proposal type and the organization of the project leader.