

Preface

JRR-3 is a 20 MW (worldwide medium scale) research reactor owned by Japan Atomic Energy Agency (JAEA) in Tokai, Ibaraki, Japan. JRR-3 was shut down after the Great East Japan Earthquake in 2011; however, all related safety issues were resolved and operations were resumed in February 2021. The General User Program (GUP) of JRR-3, which is managed by Institute for Solid State Physics (ISSP), University of Tokyo, resumed operation in July 2021 and has been operating for about three years. The current number of GUP users has recovered to the pre-shutdown level, and various scientific results have been published after the restart of JRR-3. On this occasion, we plan special topics of JPSJ with papers on the development of instruments at the revived JRR-3 and on condensed matter research using these instruments.

Twelve university-managed neutron-scattering instruments (eight by ISSP, three by Tohoku University, and one by Kyoto University) are installed at JRR-3. They include two neutron diffractometers (single-crystal and powder), seven inelastic scattering spectrometers (triple axis and time of flight), one small-angle scattering instrument, one reflectometer/interferometer, and one spin-echo spectrometer, all of which are currently being utilized for studies pertaining to condensed matter physics and material science. These instruments are managed by ISSP, Tohoku University, Kyoto University, and Ibaraki University. The special topics include not only an overview of the instruments and their performances but also the improvements realized during the shutdown period and recent research trends for each instrument.

The special topics will enlighten readers who are considering the use of JRR-3 regarding the feasible types of experiments and the achievable data quality. Furthermore, they are expected to promote the complementary use of steady (JRR-3) and pulsed neutrons (J-PARC), which will become mainstream in the future. The current special issue is expected also to facilitate the construction of a new research reactor at Fukui.

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