EPSILON and SKAT spectrometers. Status and Future Perspective

Frank.R.Schilling[1], Niko Frotzheim[2], J.Kossak[2], Vadim Sikolenko[1,3]

[1]*Karlsruhe Institute of Technology, 76131 Karlsruhe, Germany*
[2]*University of Bonn, 53113 Bonn, Germany*
[3]*Frank Laboratory of Neutron Physics, Joint Institute for Nuclear Research, 141980 Dubna, Russia*

frank.schilling@kit.edu

Based on a long lasting collaboration between JINR and German research institutions the two experiments EPSILON and SKAT are operated by German universities (KIT, University of Bonn) in the frame of BMBF-JINR collaboration: The stress-strain-diffractometer EPSILON (KIT) and the texture diffractometer SKAT (Bonn) are specifically developed for geoscientific samples. They allow for sample characterization in a wide energy range of energies with high resolution. In spite of covid restrictions, the scientific program has been successfully performed last year, made possible by additional efforts by scientists on the ground. The temporary IBR-2 shutdown will be used for upgrades of both instruments. This program includes:

- upgrade of EPSILON neutron guide: a focusing condensor will be installed to increase the flux at the sample position ~ 3 times
- new press will be developed for EPSILON sample environment in order to increase efficiency of scattered neutron beam
- some new electronic equipment will be installed (temperature, sample monitoring, *etc.*)
- detector and collimation system for SKAT will be completely renewed.
- new sample positioning system will be installed on SKAT: This applies in particular to the installation of a sample changer
- upgrade of SKAT neutron guide: based on experience from EPSILON, a focusing condensor will be installed to increase the flux at the sample position ~ 2 times (estimate)
- A new detector configuration will be tested at SKAT to create an expanded measuring arrangement while using the existing detector rings. The extensions are based on the proposal by R. Vasin presented at PAC 2020 (SKAT - Texture Diffractometer, project 2, Proposals for Development of a Suite of Instruments for Condensed Matter Research at the IBR-2 Reactor in 2021-2025