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## **Methods and instrumentation at Helmholtz-Zentrum Berlin – preparing for next generation pulsed neutron sources**

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### **Abstract**

This talk is giving a brief overview on several instrumentation and simulation activities at HZB, Berlin, which are dedicated to the exploitation of pulsed neutron sources. Currently HZB is substantially contributing to several methodological or instrumental aspects in the framework of the ESS Design-Update phase. Special emphasis is put on the experimental proof or refinement of innovative methods inherent to the long-pulse character of the future ESS neutron source. A multi-purpose beamline which hosts a flexible chopper cascade is currently being commissioned at HZB. The key feature is a chopper mimicking the ESS source pulse characteristics in pulse length and frequency. This dedicated test beamline is provided for real tests of prototype hardware, new instrument concepts and methodological developments. Key technologies important for the optimum use of future pulsed sources are neutron detectors and neutron optics. The HZB detector group contributes with their expertise in micro-strip gas chamber (MSGC) detectors based on  $^{157}\text{Gd}/\text{CsI}$ -converters and focuses on high performance readout electronics. Neutron instrumentation significantly benefits from focusing optics where new developments are undertaken as well. The Monte Carlo simulations group tackles a variety of simulation tasks ranging from spectroscopy, Larmor instrumentation and diffraction to in-depth studies for a liquid reflectometer, tomography at pulsed sources and extreme environment instrument optimizations.