



The Engineering Diffractometer BEER at ESS - Features and Status Update

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The neutron time-of-flight engineering diffractometer BEER (Beamline for European Materials Engineering Research) is currently under construction at the European Spallation Source (ESS).

The main tasks of BEER are to enable fast in situ and in operando characterization of materials and their microstructure during processing conditions close to real ones and to provide state-of-the-art and fast analysis of residual stresses, phase analysis and microstructure/crystallographic texture characterization.

These tasks are supported by the instrument design. It enables, for example, to choose between a standard pulse shaping chopper technique or a newly developed technique called pulse modulation. The latter extracts several short pulses out of the long ESS pulse. Thus leading to a multiplexing of Bragg reflections and to substantial intensity gain for high symmetric materials while preserving the resolution. By the combination of both chopper techniques, BEER is a versatile engineering diffractometer providing easy tuneable resolution/flux ratios across wide wavelength and resolution ranges. Together with a large detector coverage, BEER enables sub-second in situ measurements for fast residual strain scans; texture analysis as well as phase analysis of complex composite systems where high resolution is needed. Advanced sample environments dedicated to thermo-mechanical processing, e.g. a quenching and deformation dilatometer, support these measurements.

Here, we present the current status of the BEER instrument and its features.

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Sitzung Einordnung: Mounting Posters, Beer and light Dinner

Track Klassifizierung: Instrumentation & Data Management