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FIREPOD –the fine resolution powder diffractometer @ Berlin research reactor BER II

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The fine-resolution neutron powder diffractometer E9 [1] at the BER II research reactor at the Helmholtz-Zentrum Berlin für Materialien und Energie is dedicated to collect high quality diffractograms suited for crystal structure determinations and Rietveld refinements.

The detector bank consists of eight individual 2D detectors, arranged at an optimized, non-constant distance from the sample, and a radial collimator to reduce background noise.

Position-sensitive data integration results in a strongly reduced peak asymmetry. Through the choice of sample diameter, axial focus length, and primary collimation a wide range of combinations of intensities, resolution curves, and sample volume can be obtained.

The instrument allows the use of a large variety of sample environments, covering temperatures from 1.5 - 2000 K, pressure up to 2.5 kbar, variable magnetic fields (up to 5T) and 10 different gas-adsorption modules (4 K to 1500 K and up to 10000 bar). Possible load gasses include nitrogen, hydrogen, heavy hydrogen, argon and helium. For room temperature measurements we offer a 10-fold automatic sample changer.

[1] Helmholtz-Zentrum Berlin für Materialien und Energie. (2017). E9: The Fine Resolution Powder Diffractometer (FIREPOD) at BERII. *Journal of large-scale research facilities*, 3, A103

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