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High-throughput powder diffractometer ERWIN – design, capabilities and opportunities

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An emergent need for high-throughput monochromatic diffraction instrument at MLZ was identified. The instrument will be addressing a large section of reciprocal space in gapless fashion and adopting sufficient dynamic range with μs time-resolution, suited for both rapid data collection and studies of small sample volumes in the range of mm^3 , allowing for a variety of different sample environments and having a capability to eliminate their contributions. Instrument ERWIN will bridge the gap in functionality between high-resolution powder diffractometer SPODI, engineering diffractometer STRESS-SPEC, fine-resolution FIREPOD and time-of-flight diffractometers POWTEX\SAPHIR.

In the current contribution a final concept of medium-resolution neutron powder diffraction option ERWIN at beam port SR8b at FRM II will be presented. By its design the instrument ERWIN – “Energy research with neutrons” is especially adapted for structural characterization of energy materials and electrochemical storage systems by applying simultaneous bulk/spatially resolved neutron powder diffraction. Besides this a number of useful experimental options and features enabling studies of small samples using an adapted radial collimator, rapid parametric measurements as a function of external parameters, time-resolved studies etc will be discussed.

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