Contribution ID: **45** Type: **Poster**

Hot Neutron Single Crystal Diffraction on HEiDi: New Applications and Perspectives

Friday 6 December 2024 13:45 (3 hours)

The single-crystal diffractometer HEiDi at MLZ offers a broad spectrum of thermal and hot neutrons, excellent resolution, access to a large region of reciprocal space, low absorption and high sensitivity for light elements, making it a versatile tool for extended studies on many structures for nowadays topics in solid state physics, chemistry & mineralogy.
A key feature of HEiDi is its sample environment: Low T measurements are possible down to ~2 K, e.g. to study magnetic structures of rare earth orthoferrites (DFG SA 3688/1-1). A mirror furnace allows not only high T measurements up to 1300 K but also dedicated gas atmospheres to study light elements in potential battery materials, e.g. excess oxygen incorporation in brownmillerites and layered perovskites (DFG ME 3488/2-1) for a better understanding of the underlying diffusion processes and related structural and electronic changes. An optimization for tiny samples « 1 mm^3 and high pressure cells within two BMBF projects (BMBF 05K16PA3, 05K19PA2) enables isotropic HP experiments up to 10 GPa, even at low temperatures, as new application and allowed development of a small Li-glass based area detector (PSD) prototype optimized for short λ.
As future extension of HEiDi's capabilities we plan a wide angle version of this PSD. Access to large Q matches perfectly the growing need for total scattering studies, offering PDF analysis (pair distribution function) to study locally disordered functional materials as new application.

Primary author: Dr MEVEN, Martin (JCNS/FZJ)

Co-authors: FABRYKIEWICZ, Piotr (Institute of Crystallography, RWTH Aachen University, Germany and Jülich Centre for Neutron Science (JCNS) at Heinz Maier-Leibnitz Zentrum (MLZ), Forschungszentrum Jülich GmbH, Garching, Germany); GRZECHNIK, Andrzej (Jülich Centre for Neutron Science-4); ENGELS, Ralf; Prof. ZOBEL, Mirijam (RWTH Aachen University)

Presenter: Dr MEVEN, Martin (JCNS/FZJ)

Session Classification: Poster Session

Track Classification: Structure Research