Poster

Status and new developments at the Extreme Conditions beamline (ECB, P02.2) PETRA III, DESY

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Here we describe the current state and recent advancements in diamond anvil (DAC) research capabilities at the Extreme Conditions Beamline (ECB, P02.2), PETRA III, Hamburg, Germany [1,2]. The ECB specialises in DAC experiments in the fields of high-pressure physics, geophysics, chemistry and materials science. The beamline provides a tightly focused X-ray beam at high energies and high brilliance, allowing examination of samples under extreme conditions of temperature and pressure.

The ECB at PETRA III, accommodates User diffraction experiments on single crystals, powders and multi-grain assemblages at extreme conditions, including simultaneous high or low temperatures (from >5000 to 4 K) at high pressure (up to megabar range). P02.2 utilises the highly brilliant PETRA III X-ray source at high energies (25 or 43 keV) alongside fast area detectors to enable time-resolved diffraction experiments at the microsecond scale, providing insights into dynamic processes. Recent advances include the investigation of hierarchical structures in both space and time by utilising Partially-Coherent Propagation-Based Phase Contrast Imaging in the dynamic and laser-heated DAC experiments.

References

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