

MS15-P02 | Xpress: LATEST RESULTS FROM THE NEW DEDICATED HIGH PRESSURE DIFFRACTION BEAMLINE AT ELETTRA

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With the recent opening of the Xpress beamline the high pressure (HP) diffraction community have a dedicated experimental set up at the Elettra synchrotron facility. Xpress is part of a scientific partnership between India and Italy under a project administered through the IISc Bangalore, and utilize the radiation from a 49 poles, 3.6 Tesla Superconducting Wiggler, to produce a 25 keV monochromatic X-ray beam focused on a large area detector (fastMAR345) for data acquisition in angle dispersive mode.

The beamline allows powder diffraction experiments using a variety of diamond anvil cells (DAC) and is equipped with online ruby fluorescence spectrometer, long working distance microscope, precision microdriller, automatic pneumatic pressure controller, etc. In front of the detector a precision stage enables easy switching between the pressure monitoring ruby fluorescence and the diffraction data collection using finite size (tens of microns in diameter) monochromatic x-ray beam. A commercial gas loading system, an *in house* developed cryogenic gas loader and a LN₂ cryo stream are currently in the advanced stages of commissioning. Very recently, single crystal (SC) XRD measurements under HP were successfully commissioned in a membrane DAC; once further improvements will be implemented, *HP-single crystal* will be available for the users.

We will present recent scientific highlights of the beamline activity performed on both powder and SC under HP, such as pressure-induced amorphisation, pressure-induced phase transition, insertions and synthesis of new nanocomposites.