

MS17-01 | DYNAMIC COMPRESSION OF MATERIALS AT PRESSURES OF EARTH'S INTERIOR USING THE dDAC

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Phase transitions play a central role for the structure and dynamics of Earth deep mantle. Here, I will discuss results of high-pressure experiments where we employ a diamond-anvil cell driven by a piezoelectric actuator (dynamic DAC) to dynamically compress Earth materials across phase transitions that are expected to occur in Earth's lower mantle. I will present results of two types of experiments, where (a) materials are compressed over a wide range of compression rates (up to about 1 TPa/s) and (b) the pressure (stress) imposed on the sample material is oscillated around a mean pressure. In our experiments, we monitor the elastic and structural response of the materials by time-resolved in-situ x-ray diffraction at the Extreme Conditions Beamline (ECB) at PETRA III, DESY, Germany. I will discuss the implications of our results for understanding Earth's deep interior and highlight some possible future directions.