Properties of deep mantle melts

Chrystele Sanloup*[1]

[1]Universite Pierre et Marie Curie (UPMC) – Université Pierre et Marie Curie (UPMC) - Paris VI, Université Pierre et Marie Curie [UPMC] - Paris VI – France

Abstract

Magmas in the current day Earth are produced essentially at lithospheric pressures, at the exception of ultra deep melts detected by seismology at the mantle-core boundary. The latter are possible remnants of the early magma ocean or result from partial melting of rocks with a lower melting point than the bulk mantle. Exploring the physical properties of magmas at such depths is therefore key to understanding the nature and origin of these melts. It is now possible to collect in situ synchrotron X-ray diffraction data collected on deep mantle melts up to the megabar range, and extract some quantitative information on interatomic distances and density. Data collected on molten basalt and molten carbonate using laser-heated diamond anvil cells will be presented, along with complementary X-ray Raman data collected on quenched carbonate samples. The structural information on both type of melts will be discussed, along with the implications for their likely contrasting mobility at depth.

*Speaker