

Static vs dynamic compressibility of vitreous silica under pressure

Weigel, Coralie¹; Coasne, Benoit³; Polian, Alain²; Foret, Marie¹; Vacher, René¹; Ruffle, Benoit¹

¹. Laboratoire Charles Coulomb, Université de Montpellier, Montpellier, France.

². IMPMC-CNRS UMR 7590, Université P. et M. Curie, Paris, France.

³. LIPHY, Université Joseph Fourier, Grenoble, France.

The talk will discuss the elastic properties of vitreous silica submitted to high pressures in a diamond anvil cell. A particular emphasis will be given to the observed difference between static and dynamic compressibility. We show for example that the compressibility of a silica sample immersed in helium or neon fluid is much smaller than expected from its elastic properties measured by Brillouin light scattering. It results from gas atom penetration into the interstitial free volume of the glass network. This adsorption-induced expansion can be described by a generalized poromechanical model. We also address the case of silica pressurized under argon.