Applications of XAFS to metallic glasses under high pressure

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Metallic glasses (MGs) are amorphous solids with a liquid-like atomic structure, i.e. lacking the transitional symmetry of crystals. Their local atomic arrangement can be described in terms of densely packed atomic clusters [1]. Hydrostatic compression of the order of tens of gigapascals induces significant modifications of geometry and arrangement of those clusters and affects the properties of MGs. XAFS technique provides a unique opportunity for experimental studies of MGs and resolving their complex, non-periodic atomic structure. During the past decade, there has been an increased interest in high-pressure structural studies of solids, in particular in XAFS experiments involving diamond anvil cells. Those experimental studies are often supplemented by computational techniques such as molecular dynamics simulations and *ab-intio* calculations.

In this seminar, some examples of the application of high-pressure EXAFS to investigate the characteristic features of the local atomic structure of Ce-Al [2] and Zr-Cu metallic glasses [3, 4] will be presented. We demonstrate significant changes in the local atomic order, “polyamorphic” transition and pressure-induced devitrification. Moreover, we will present the significant role of simulations for understanding experimental results of studies of MGs atomic structure.

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