

## Structural and Microscopic Relaxations in Glycerol: An IXS Study

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We present an x-ray scattering study of the THz dynamics of room temperature glycerol at pressures spanning the 0.66-3 Kbar range, the measurement have been performed at HERIX spectrometer (Sector 30) of APS. We propose a comparison with ultrasound absorption results available in literature, which leads to identify the presence of two distinct relaxations, a slow and a fast one. Although the former has been already thoroughly studied in glycerol by lower frequency spectroscopic techniques, no hints on the latter are so far available in literature. We observe that the characteristic timescale of this fast relaxation ranges in the sub-picosecond, tends to decrease with increasing the wave-vector and seems rather insensitive to pressure changes. Concerning the fast relaxation process, its timescale and strength are intriguingly linked to each other; such a links definitely reveals the microscopic, single particle, nature of the involved process.