

Infra Red Photon Correlation Spectroscopy

Last Updated Thursday, 27 August 2015

Dynamic Light Scattering (DLS) is a well established, robust technique, for the investigation of dynamics in colloidal systems, polymers and glass forming materials. Traditionally, visible light from a laser source has been utilized as probe, with some limitations due to absorption in non transparent samples and multiple scattering in dense suspensions. More recently, the use of highly collimated X-ray beams become possible (XPCS), extending this technique at higher values of momentum transfer. We developed a further extension to perform dynamic light scattering with infrared radiation ($\lambda = 1064 \text{ nm}$), opening the possibility to study non transparent systems. Applications range from the study of slow dynamics in polymeric systems to the structural relaxation in chalcogenide glasses. With our first application of IRPCS, published in Physical Review Letters, we shed light on the λ transition in liquid Sulfur, an unusual abrupt increase of viscosity upon heating which we find to be connected to a relaxation on the millisecond timescale.