SFB1242

SFB 1242 Nichtgleichgewichtsdynamik kondensierter Materie in der Zeitdomäne

UNIVERSITÄT DUISBURG ESSEN

Open-Minded

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Capturing water's structural dynamics: from seconds to femtoseconds

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The dynamics of liquid water feature a variety of time scales, ranging from extremely fast ballistic-like thermal motion, to slower molecular diffusion and hydrogen-bond rearrangements. Here, I will presented our studies [1, 2] using coherent X-ray diffraction to investigate the dynamics of water from ambient conditions down to supercooled temperatures and close to the glass transition, as well as during the transition from a high density liquid (HDL) to a low density liquid (LDL) form.

This novel approach utilises the inherent capability of X-ray Photon Correlation Spectroscopy (XPCS) to measure intermolecular dynamics with lengthscale selectivity, by measuring oxygen motion in momentum space. In addition, we will discuss of future outlook and possibilities of extending such measurements to capture the dynamics of water molecules in various aqueous biological solutions.

[1] F. Perakis et al., "Diffusive dynamics during the high-to-low density transition in amorphous ice," PNAS **114**, 8193 (2017).
[2] F. Perakis et al., "Coherent X-rays reveal the influence of cage effects on ultrafast water dynamics," Nat. Commun. **9**, 1917 (2018).

Für diese Zeit steht eine Kinderbetreuung nach vorheriger Anmeldung zur Verfügung.

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