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Low-energy electron transport in water

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Even though low-energy electron scattering in liquid water is of high relevance for the modelling of radiation damage processes, radiolysis, and the analysis of photoelectron spectra, detailed scattering data have so far neither been accessible by experiment nor by theory. For lack of liquid water data, current descriptions thus use the amorphous ice data and/or rescaled gas phase parameters to describe the scattering of low-energy electrons (LEEs) ($< 50\text{eV}$ electron kinetic energy). The important parameters are the multiple differential cross sections (MDCs) with respect to electron kinetic energy, energy loss, and scattering angle, of all relevant scattering processes (elastic; inelastic (electron-phonon, electron-vibron, electron-electron)). Our recent determination of MDCs for liquid water from photoelectron spectroscopy provides a starting point for definite answers to fundamental questions regarding the electron dynamics in water.

Summary

Primary author: Prof. SIGNORELL, Ruth (ETH Zürich)

Presenter: Prof. SIGNORELL, Ruth (ETH Zürich)

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