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Investigating structures and dynamics at liquid interfaces with ultra fast timescales

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Liquid interfaces witness renewed interest from physics, chemistry, and biology to gain fundamental insight and to develop applications, including nanomaterial synthesis and food science. To extend investigations of structure and growth at liquid –vapour[1] and liquid –liquid interfaces[2] to ultrafast time scales, we recently installed an optical pump –X-ray probe facility at the Liquid Interfaces Scattering Apparatus (LISA) [3]. The LISA diffractometer, at the P08 beamline at PETRA III, is specialized for X-ray scattering studies of liquid interfaces without moving the sample. In the new development, a synchronized femtosecond-laser system and optics direct a laser pulse onto the liquid sample surface delivering a time resolution better than 100ps. These new capabilities provide access to structural changes on nanometer length scales induced via optical excitation, allowing us to understand the non-equilibrium processes on liquid interfaces. In the case of liquid mercury, we focus on non-equilibrium dynamics of capillary waves after ultrafast thermal excitation. We have also investigated pure water and water-based solutions to investigate the influence of excited solvated electrons and their relaxation on the structure of the free liquid surface.
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1. J. Haddad, *et al.* PNAS 201716418 (2018).
2. B. M. Murphy, *et al.*, Nanoscale 8, 13859 (2016).
2. B. M. Murphy *et al.*, J.Synchrotron Rad. 21, 45 (2014).

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