Contribution ID: **11** Type: **Poster**

Tripling of Q-range of X-ray reflectivity on liquid surfaces using a double-crystal deflector

The investigation of processes occurring at atomic and molecular levels at the surfaces and interfaces of liquids is of paramount importance for fundamental surface science and practical applications in physics, chemistry and biology. One of the most widely used X-ray-based techniques for the characterization of liquid surfaces is X-ray reflectivity (XRR). One general difficulty exists in performing XRR on liquid surfaces since neither the liquid sample nor the synchrotron source can be tilted. The requirement of variation of the X-ray beam grazing angle at the sample surface to change the scattering vector component perpendicular
to the surface, introduces significant experimental difficulties. Different technical solutions have been implemented to overcome this problem. The synchrotron X-ray beam can be inclined with respect to the horizontal sample plane using mirrors or single or double Bragg reflections from crystals. Majority of existing double crystal deflectors (DCD) can achieve the maximum scattering vector as 2.5 1/A. At ESRF beamline ID10, a procedure that significantly extends three times the conventional maximum range of momentum transfer perpendicular to the surface qz was developed. Method and application of this new procedure is demonstrated for a bare and a graphene covered liquid copper surface. The proposed method allow for new experiments with liquid-metal surfaces and
other systems.

Please select the related topic from the list below

Instrumentation and methods

Primary author: KONOVALOV, Oleg (ESRF)

Co-authors: Dr RENAUD, Gilles (CEA, IRIG); Dr GROOT, Irene (Leiden University); Dr JANKOWSKI, Maciej (ESRF); Dr SAEDI, Mehdi (Shahid Beheshti University); Dr BELOVA-REIN, Valentina (ESRF)

Presenters: Dr JANKOWSKI, Maciej (ESRF); KONOVALOV, Oleg (ESRF)

Session Classification: Poster session