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Development of In-situ Resonant Soft X-ray Scattering for Soft Materials at Advanced Light Source CHENG WANG, ALEXANDER HEXEMER, ANTHONY YOUNG, HOWARD PADMORE, Lawrence Berkeley National Laboratory — Resonant Soft X-ray Scattering was developed at ALS over the past a few years. It combines soft x-ray spectroscopy with x-ray scattering and offers statistical information for 3D chemical morphology over a large sample area. Its unique chemical sensitivity, large accessible size scale, polarization control and high coherence make it a powerful tool for mesoscale chemical/morphological structure characterization for many classes of materials. However, in order to study sciences in naturally occurring conditions, we need to overcome the sample limitations set by the low penetration depth of soft x-rays and requirement of high vacuum. Adapting to the evolving environmental cell designs utilized increasingly in the Electron Microscopy community, we will report our development of customize design liquid/gas environmental cells that will enable soft x-ray scattering experiments on biological, electro-chemical, self-assembly, and hierarchical functional systems in both static and dynamic fashion. Initial RSoXS result of solar fuel membrane assembly/fuel-cell membrane structure in wet cell will be presented.

Cheng Wang
Lawrence Berkeley National Laboratory

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