

Developments of in-situ X-ray scattering diagnostic tools for studies of combustion and reactive systems

Tuesday, 30 September 2014 08:00 (25 minutes)

Emerging high brilliance X-ray radiation at different accelerator facilities around the world will give access to many types of new studies in-situ under complex experimentally challenging dynamic conditions: High temperatures, pressures, and densities, which also can present strong gradients.

During the last decade our group has been performing experiments at MAX-lab, the APS, and the ESRF. During this time it has been possible to develop detection systems and diagnostics tools for the study of combustion related phenomena, such as particles formation dynamics in flames, aggregation and phase transitions of particles under combustion like condition. It has also been possible to do introductory studies on levitated drops and study evaporation and structural properties. One of the achievements is a combined small-angle and wide-angle X-ray scattering (SAXS+WAXS) detection system that has been built and operated at different beamlines.

In this presentation an overview of our tools, activities, results and future perspective will be given.

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Session Classification: Session 3 Spray and particulate matter (Ossler)