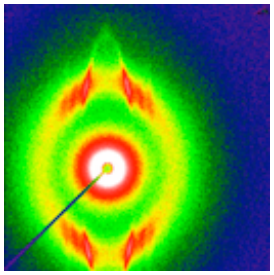

Contribution ID: **24** Type: **not specified**

Contr. Talk 1 - Sedimentation Induced Flow and Anomalous Dynamics in Field Driven Self-assembly of Magnetic Colloids Studied by XPCS

Monday 10 December 2018 14:10 (20 minutes)

We have studied the non-equilibrium dynamics of self-assembled magnetic peanut-shaped colloids in the presence of a magnetic field. The micrometre-sized particles align in a direction perpendicular to the applied external magnetic field, and assemble into chains along the field direction. The anisotropic dynamics of these particles is investigated using multispeckle ultrasmall-angle X-ray photon correlation spectroscopy (USA-XPCS). Perpendicular to the applied field, which is also the direction of gravity, a sedimentation induced flow develops. XPCS allows us to investigate the resulting anisotropic dynamics, and in particular to decouple contributions from the sedimentation induced flow, thermal diffusion of the assembled chains and individual particles, and the internal collective dynamics of the assembled mesoscopic structures over a large range of length scales. Our experiments demonstrate the power of XPCS to investigate complex dynamic processes that arise due to a combination of diffusive and flow-induced processes. Given the very small scattering volume probed in an XPCS experiments, this opens up interesting possibilities for investigation spatially heterogeneous dynamics in highly turbid media that cannot be probed with optical techniques.

Presenter: PAL, Antara (Division of Physical Chemistry, Lund University)

Session Classification: Early afternoon session - Colloids