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Development of a Sample Environment for in-situ Dynamic Light Scattering in Combination with Small Angle Neutron Scattering for the Investigation of Soft Matter at the European Spallation Source

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The most brilliant and most powerful neutron source in the world, the European Spallation Source ESS, is currently built in Lund. In the scope of the project "FlexiProb"three modular sample environments for the investigation of soft matter samples to maximize the potential of the ESS with regard to the very high neutron flux are being developed.
These are sample environments for small angle neutron scattering (SANS) with *in-situ* dynamic light scattering (DLS), under gracing incidence (GISANS) developed at TU Munich and on free-standing liquid films and foams developed at TU Darmstadt. All sample environments are built on an universal carrier system to ensure a high repeatability and flexibility as well as a minimum switching time between different sample environments and SANS machines.
The *in-situ* DLS & SANS module developed in our subproject will provide additional control parameters, in particular the sample stability, during the SANS measurements. For that, the module allows the simultaneous measurement of SANS and DLS at two different scattering angles and instant evaluation of the sample sizes distribution. To accomodate for the high neutron flux at ESS, we developed a special sample holder suitable for the precise temperature control of about 40 samples.

Primary authors: WIEHEMEIER, Lars; SCHMID, Andreas (Physikalische und Biophysikalische Chemie, Universität Bielefeld); FRIELINGHAUS, Henrich (JCNS); HELLWEG, Thomas (Universität Bielefeld, PCIII)

Presenter: WIEHEMEIER, Lars

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