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SAGA: A surface scattering beamline for ESS

Surface science has developed enormously over the last decades and interfaces play an increasing role in applications as well as many areas of science. This fact is in part related to new instrumental capabilities allowing to extract information with high resolution and sensitivity.

Neutron scattering methods offer unique opportunities, as the neutron is sensitive to light elements, low energy excitations and the magnetic induction. Surfaces and interfaces are studied with neutron reflectometry, which allows to extract density profiles along the surface normal. Lateral correlations can be studied by off-specular and grazing incidence small angle scattering (GISANS). However, sample volumes are small and neutron beams are comparably weak.

The European Spallation Source (ESS) will soon be commissioned and offer unprecedented brilliance for neutron scattering experiments. This offers a unique opportunity for the construction of a dedicated surface scattering beam line optimized for GISANS. In this presentation we summarize the scientific case and conceptual design of SAGA, which will be proposed as one of the instruments 16-22 at ESS. SAGA will offer high resolution to allow depth sensitive surface scattering studies and complement reflectometry and SANS capabilities at ESS. We propose a 65-70 m long instrument with a wavelength frame multiplication option for 1% wavelength resolution, including capabilities to measure neutron reflectometry. Once built the instrument will offer a platform to extract three-dimensional information on surface and near interface structures over a wide range of length scales.

We submit this contribution on behalf of the SAGA consortium and will present the input from the working groups, focusing on the different aspects of the instrument specifications and design.

Please select the related topic from the list below

Instrumentation and methods

Primary authors: KOEHLER, Sebastian; ARNOLD, tom (ESS); WACKLIN, hanna; KLAUSZ, Milan (ESS); BIRCH, Jens (Linköping University); WOLFF, Maximilian; NYLANDER, Tommy

Presenter: WOLFF, Maximilian

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