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Small-angle Neutron Scattering Instrument and Applications at China Spallation Neutron Source

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Microstructure at atomic- to nano- scale is one of the key factors that determining the mechanical and functional properties of matter. Therefore, accurate design and characterization of these microstructure are significant for properties'manipulation in materials science. One of the novel nanostructure probe method is small-angle neutron scattering (SANS), which can unravel the fluctuation of composition, density and magnetism at 1~100 nm length-scale. Due to the high penetration, nondestructive and sensitivity to spin and light elements of neutrons, SANS finds a broad application in multidiscipline fields.
The SANS instrument at China Spallation Neutron Source (CSNS, located in Dongguan) has started to operate and open to international users from 2018. By using this instrument, we have conducted a series of off-site and in-situ SANS experiments under elevated temperature, cryogenic condition, mechanical stress and magnetic field loading [1]. These observations enable us a deep insight into the size, morphology and kinetic evolution of nanoheterogeneity in matters, including particles, precipitates, pores, and domains within hard matters as well as the macromolecule chain, aggregation, and self-assembly structure of soft matters.
A large amount of valuable users'research has been completed and result in more and more publication in high impact journals. Based on its characteristics, the instrument specifications and research scope of SANS technique will be presented. Moreover, typical case study on SANS@CSNS will be demonstrated in the introduction of SANS application in multidisciplinary research.

I apply for the best Poster Poster Award

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Sitzung Einordnung: Mounting Posters, Beer and light Dinner

Track Klassifizierung: Instrumentation & Data Management