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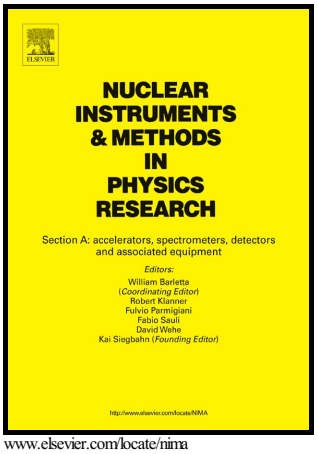

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The new small-angle neutron scattering instrument SANS-1 at MLZ - characterization and first results

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Abstract

A thorough characterization of the key features of the new small-angle neutron scattering instrument SANS-1 at MLZ, a joint project of Technische Universität München and Helmholtz Zentrum Geesthacht, is presented. Measurements of the neutron beam profile, divergency and flux are given for various positions along the instrument including the sample position and agree well with Monte Carlo simulations of SANS-1 using the prgram McStas. Secondly, the polarization option of SANS-1 is characterized for a broad wavelength band. A key feature of SANS-1 is the large accessible Q-range facilitated by the sideways movement of the detector. Particular attention is hence paid to the effects that arise due to large scattering angles on the detector where a standard $\cos^3$ solid angle correction is no longer applicable. Finally the performance of the instrument is characterized by a set of standard samples.

Keywords: small-angle neutron scattering, Neutron diffraction, Monte Carlo simulation, Neutron instrumentation

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