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**Performance of a Thermal-Neutron Double-Crystal Diffractometer for USANS at NIST.** Charles Glinka, John Barker, James Moyer, Man-Ho Kim, Andrew Drews, Michael Agamalian, Center for Neutron Research, National Institute of Standards and Technology, 100 Bureau Dr., Stop 8562, Gaithersburg, MD 20899 USA.

An ultra-high-resolution, small-angle neutron-scattering (USANS) double crystal diffractometer (DCD) has been constructed at the NIST Center for Neutron Research (NCNR). The instrument uses multiple reflections from perfect single crystal silicon (220), before and after the sample, to produce a low instrument background suitable for small angle scattering measurements. The minimum detector background to beam intensity ratio is  $5 \times 10^{-7}$ . The instrument is located on a dedicated thermal neutron beam port, utilizing 2.38 Å wavelength neutrons, producing a  $17,000 \text{ cm}^{-2}\text{s}^{-1}$  peak neutron flux at the sample. The measurement range of the instrument extends from  $3 \times 10^{-5} \text{ \AA}^{-1}$  to  $0.02 \text{ \AA}^{-1}$  in scattering wavevector ( $q$ ), corresponding to structure size information in materials ranging from 0.03 μm to 20 μm. If the capability of the DCD is combined with the NCNR's 30 m long pinhole type instruments covering  $0.001 \text{ \AA}^{-1}$  to  $0.6 \text{ \AA}^{-1}$  in  $q$ , structure in materials from 0.001 μm to 20 μm can be measured. The design and characteristics of the instrument, and the mode of operation, are described, and data are presented which demonstrate the instrument performance.