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The design and current status of the high-resolution neutron diffractometer at China Spallation Neutron Source

A new neutron diffractometer is under construction at China Spallation Neutron Source, which aims to reaching a world-leading resolution of $\Delta d/d \leq 0.05\%$ and bearing a moderate flexiblity of varying resoultion and brightness. Fully elliptical geometry in both vertical and horizontal directions is impletmented in neutron guides and high-frequency T0 chopper is adopted to increase the flux gain of short wavelength neutrons, which could impove the statistics at long-Q range, so that high Q-resolution pair distribution function analysis could potentially be realized. The diffratometer is designed to have large solid- angle coverage of 3He PSD detectors, spanning from 5 degree to 177 degree in the horizonal plane and from -28 degree to 28 degree in the vertical plane. Its flexibility allows versatile diffraction measurements, encompassing long-time data collection of the high- resolution powder diffraction patterns, quick measurement of small powder samples, as well as single-crsytal diffraction measurement.

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