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The design of high-energy direct-geometry chopper spectrometer at CSNS

The High energy Direct geometry spectrometer (HD) is a direct geometry time-of-flight chopper spectrometer[1]. It will be the first inelastic neutron scattering instrument at the China Spallation Neutron Source. Currently, the spectrometer construction has been completed and under commissioning. when it opens to the user, it will fulfill the increasing beam-time demand from the user from all over the world.

With its high neutron flux and a 160◦ angular coverage of 3 m long positionsensitive 3He detectors, the spectrometer will mainly be used to probe inelastic signals of novel spin and lattice dynamics in condensed matters and functional materials. The HD spectrometer is equipped with three switchable Fermi slit packages providing monochromation for both thermal and epithermal neutrons from 10 meV to 1500 meV, as well as a high-resolution repetition-rate multiplication (RRM) mode using curved slits. A special feature as a strict single incident energy mode can be provided using the combination of specially designed disk choppers and Fermi choppers. The design of the HD spectrometer will be presented in the poster.

[1] Wei Luo, et al. Nuclear Inst. and Methods in Physics Research, A 1046 (2023) 167676.

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