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Development of In Situ Sample Environment Technology for Neutron Scattering at CSNS

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As one of the important auxiliary devices for neutron scattering instruments, sample environment provides various experimental conditions to enhance the research capabilities of the instruments. The sample environment at the Chinese Spallation Neutron Source (CSNS) has been providing in-situ experimental services since the commissioning of the instrument in 2018. It has evolved from initially serving as a cryostat to now supporting a wide range of sample environments, including low temperature, high temperature, high pressure, and magnetic field, catering to different user needs. The development has enabled the transition from single-sample environment experiments to multiple-sample environment experiments, showcasing the progress from 0 to 1 and from 1 to many in terms of experimental applications. This article primarily introduces the operation and usage of the sample environment at CSNS. It also highlights recent developments and optimizations in sample environment. Additionally, some experimental applications conducted in collaboration with users are also presented.

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