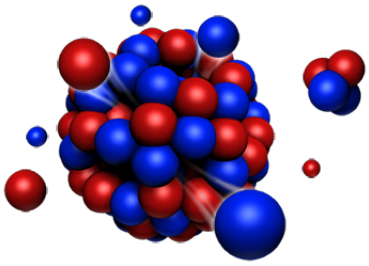

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China Spallation Neutron Source Target Station Status

The China Spallation Neutron Source (CSNS) is an accelerator based multidiscipline user facility located in Dongguan, China. CSNS ramped the beam power to 50kW and consistently achieved an availability of more than 90%. This report emphasizes the status of CSNS Target Station during the operating period. The CSNS target is made of eleven tungsten plates with the different thickness. The interface bonding between the tungsten plates and the 0.3mm-thick tantalum cladding has been proved very stable and reliable. CSNS has three types of moderators to provides the different pulse shapes of neutrons to meet the requirement of the scientific research. Now the Moderator-Reflector (MR) plug has been installed in the target station and the cryogenic system guarantees the circulation of the supercritical and para hydrogen in the loop and moderator safely, which is very important to export the stable and continuous neutron beams. The target station water cooling system has three independent cooling loops. Two light water loops are used to remove heat deposition from pre-moderators, moderators, proton beam window and helium vessels. The other heavy water loop is used for cooling target and reflector. The water-cooling system has been operating smoothly during the whole operating period. The CSNS target station use the 4.8 meter-radius steel adding 1.2- meter-thick heavy barite concrete as the target shielding basis. The dose rate at the area outside the target station is much lower than 2.5μSv/h under the 50kW operating power.

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