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# The SNS Moderator Test Station

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We will describe the Moderator Test Station proposed for the Spallation Neutron Source facility. We will leverage the Beam Test Facility (BTF) at the Spallation Neutron Source (SNS) to provide a moderator neutronics test stand with which we will verify the anticipated performance gains expected and required from innovative moderator concepts central to the SNS Second Target Station (STS), as well as improve our understanding of the performance of the moderators on the First Target Station (FTS). These concepts include high brightness parahydrogen tube moderators and high volume parahydrogen moderators for the STS, and temperature / density effects on performance of water and hydrdogen moderators for the FTS.

The SNS BTF, already operational, incorporates an ion source and a 2.5 MeV Radio Frequency Quadrupole (RFQ) substantially the same as the SNS front end. We will use a proton beam chopper similar to that already used in the SNS at the RFQ exit, various proton beam transport components, a neutron-producing lithium target, a cryogenic moderator test stand, a reflector-shielding assembly, and a performance assessment neutron beamline. The MTS will provide the ability to test large-volume and compact moderator concepts in a prototypic wing configuration, measuring the wavelength-dependent transverse brightness distribution with imaging detectors and wavelength-dependent emission time distributions with time-focused analyzer arrays of the moderator concepts central to projected STS gains and FTS upgrades with significantly faster and in greater detail than at currently available test facilities. We here describe the planned layout of the Moderator Test Station neutron test beamline and moderator cryostat assembly, as well as outlining the current list of moderator configurations to be tested.

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