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## Measured Performance of SNS Moderators

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### Abstract

The Spallation Neutron Source facility, operational for almost six years, has six viewed moderator faces, each with nominally independent performance. We have characterized the neutronic performance of each moderator face, as well as the overall facility, through a number of different metrics measured on various beam lines. The absolute neutron spectrum is within 30% of expectation on all beam lines at all neutron energies between 1 eV and 1 meV. The discrepancies that are observed, although small, are consistent with a non-equilibrium level of ortho-hydrogen in the hydrogen moderator loops. Emission time distributions are also largely consistent with predictions, again with any differences indicating an elevated ortho-hydrogen level. The spectral and emission time distribution differences are variable, and we compare those trends with the time since hydrogen condensation. We have further measured the sensitivity of neutron production to proton beam position, as well as the delayed neutron fraction.