

## 2023 RaDIATE Collaboration Meeting



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# Thermal shock study of clad and bare tungsten target samples

*Thursday, 29 June 2023 14:00 (30 minutes)*

The Second Target Station (STS) of the Spallation Neutron Source (SNS) at Oak Ridge National Laboratory is currently in the preliminary design phase where extensive research and development is ongoing in support of the progressing target design. Short pulse spallation targets like SNS require an understanding of high cycle fatigue behavior due to the repeated thermal shock from the proton beam. An accurate strain prediction is critical for fatigue life assessment of STS target blocks as they will be subjected to approximately  $10^8$  beam pulses per lifetime. The Los Alamos Neutron Sciences Center Target 2 (blue room) facility was used to test the strain response of clad and bare tungsten target samples to the thermal shock of a proton pulse. Strain measurements on the outer surface of three target samples (bare tungsten, tantalum-clad tungsten, and niobium-clad tungsten) were recorded for comparison with structural simulations. In general, excellent agreement was achieved between measurement and prediction confirming analysis methods. An overview of the experiment preparation, execution, post-processing, and results will be discussed.

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