

## 2023 RaDIATE Collaboration Meeting



Contribution ID: 13

Type: **Invited Talk**

# Irradiation campaign and PIE needs for STS target systems R&D

*Tuesday, 27 June 2023 11:10 (30 minutes)*

The Second Target Station (STS) at Spallation Neutron Source (SNS) will receive 700 kW proton beam with a very low duty cycle based on a microsecond long pulse with 15 Hz repetition rate. The beam intercepting materials exposed to the high-power proton beam will suffer from long-term radiation damages, including material hardening due to displacement damage, material embrittlement and swelling due to helium production, and thermal and electrical conductivity changes due to solid transmutations. On the other hand, the sub-microsecond long short beam pulses will induce highly transient prompt dynamic thermal and structural loads in the beam intercepting materials. To design a target with a high survivability and reliability, it is important to identify the needs for the irradiation campaign and post irradiation examinations of key functional materials and prototypes. In this talk we provide an overview of the R&D program at STS dedicated to understanding of the long-term and prompt behaviors of materials exposed to intense proton beam.

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**Session Classification:** Talks