

8th High Power Targetry Workshop (HPTW2023)



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LBNF Beam Windows Remote Handling and R&D Needs

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The Long Baseline Neutrino Facility (LBNF) Project, currently under final design, will deliver neutrino beam to the Deep Underground Neutrino Experiment (DUNE) utilizing 120 GeV proton beam on a graphite target at 1.2 MW in 2031 and up to 2.4 MW by 2036. The LBNF neutrino beamline utilizes several beam intercepting devices that are being designed and built to withstand the cyclic thermal shock of the pulsed beam and provide thermal management of the absorbed power. Although operating parameters have been chosen to be within the realm of previous operational experience with neutrino targets (primarily NuMI at Fermilab and T2K at J-PARC), radiation damage effects on critical properties of the chosen materials are still not fully understood, especially effects on fatigue and dimensional stability. Due to this, a key area requiring R&D studies is the Upstream Decay Pipe Window which will experience direct beam downstream of the target. This talk will discuss the R&D needs and challenges for the Upstream Decay Pipe Window, the remote handling procedure and equipment being designed to operate on the window in the inevitable scenario of a window failure, the downstream decay pipe window analysis and design results, and a review of the Primary Beam Window analysis and R&D of the positioning cartridge.

Themes for the contribution

5 Target facility challenges:

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