Contribution ID: **7** Type: **Talk**

Advanced Materials Studies for High Intensity Proton Production Targets and Windows

Thursday, August 4, 2022 4:40 PM (30 minutes)

A high-power target system is a key beam element to complete future High Energy Physics (HEP) experiments but in the recent past, major accelerator facilities have been limited in beam power not by their accelerators, but by the beam intercepting device survivability. The target must then endure high power pulsed beam, leading to high cycle thermal stresses/pressures and thermal shocks. The increased beam power will also create significant challenges such as corrosion and radiation damage that can cause harmful effects on the material and degrade their mechanical and thermal properties during irradiation. This can eventually lead to the failure of the material and drastically reduce the lifetime of targets and beam intercepting devices.
The Long-Baseline Neutrino Facility (LBNF), under design at FNAL, plans to use Graphite for the production target, Titanium alloy as the target beam window and Be as the primary beam window. However, relatively little is known about the behavior of such materials when impacted by high energy proton beam and very limited engineering data is available to support the design and material choice for bam intercepting devices

In order to operate reliable beam-intercepting devices in the framework of energy and intensity increase projects of the future, it is essential to develop a strong R&D for robust target and beam window. The international RaDIATE collaboration, established in 2012, connects expertise in nuclear material and accelerate targets to generate useful materials data for application within the accelerator and fission/fusion communities.
After presenting the high power targetry challenges facing next generation multi-MW accelerators, I will give an overview of the most recent recent activities within the frame work of the RaDIATE collaboration in support of High Power Targetry development.

Attendance type

Virtual presentation

Presenter: PELLEMOINE, Frederique (Fermilab)

Session Classification: WG3: Accelerator Physics

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