

Beam Dump Facility target: design status, beam tests in 2018 and material studies

Monday, 4 June 2018 10:30 (20 minutes)

The Beam Dump Facility (BDF) Project, currently in its design phase, is a proposed general-purpose fixed target facility at CERN, dedicated to the Search for Hidden Particles (SHiP) experiment in its initial phase.

At the core of the installation resides the target/dump assembly, whose aim is to fully absorb the high intensity 400 GeV/c SPS beam and produce charmed mesons for the SHiP experiment. In addition to high thermo-mechanical loads generated by the pulsed beam, the most challenging aspects of the proposed installation reside in very high energy and power density deposition that are reached during operation. In addition, 320 kW are deposited in the target/dump assembly.

In order to validate the design of the BDF target, a scaled prototype is going to be tested during 2018 in the North Area at CERN, upstream the existing beryllium primary targets, with an expected deposited power of 20 kW. The prototype testing under representative beam scenarios will permit an insight of the material response in an unprecedented regime. Online monitoring and an extensive Post Irradiation Experimental (PIE) campaign are foreseen.

A complementary extensive material R&D is carried out in parallel, dedicated to the study of cladded refractory metal targets, and focusing mainly in the performance of the bonding between the cladding and core materials.

The current contribution will detail the design of the BDF target/dump core and the design and construction of the prototype target assembly, as well as the ongoing R&D studies on cladded targets, including an insight of radiation damage effects.

Primary author: Mr LOPEZ SOLA, Edmundo (CERN)

Co-authors: Dr PERILLO-MARCONE, Antonio (CERN); Dr VINCKE, Heinz (CERN); Mr BUSOM DESCARREGA, Josep (CERN); Mr KERSHAW, Keith (CERN); Dr CALVIANI, Marco (CERN); FRASER, Matthew (CERN); Dr CASOLINO, Mirkoantonio (CERN); Mr AVIGNI, Pietro (CERN)

Presenter: Mr LOPEZ SOLA, Edmundo (CERN)

Session Classification: Session 1-R&D to Support Concepts

Track Classification: 1-R&D to Support Concepts