Contribution ID: **18** Type: **Oral**

Analysis and Operational Feedback on the Current High Energy Beam Dump in the CERN SPS

Thursday, 7 June 2018 15:40 (20 minutes)

The CERN Super Proton Synchrotron (SPS) high-energy internal dump (TIDVG) is used to intercept beam dumps from 102.2 to 450 GeV. The previous device featured an absorbing core composed of different materials (graphite, aluminium, copper and a tungsten alloy) surrounded by a water cooled copper jacket. An inspection in 2013 revealed significant beam induced damage to the aluminium absorbing block, resulting in operational limitations to minimise the risk of reproducing this phenomenon. Additionally, in 2016 a vacuum leak was detected in the dump assembly, which imposed further restrictions to operations, i.e. a reduction of the beam intensity that could be dumped. In the winter stop of 2016-2017, a new version of the TIDVG (featuring several design modifications) was installed. With the proposed design, an average beam power of 60 kW can be dumped continuously (approximately 90% of the beam power is actually absorbed by the dump-shielding assembly).

This paper analyses the design of the new device and its performance observed during the commissioning period and subsequent operation in 2017. The temperature measurements recorded during this time were used to benchmark numerical models that allow predicting the behaviour of the dump under different conditions. After several iterations, a good agreement between simulations and real measurements was obtained; resulting in numerical models that can produce reliable results for this and other devices with similar design.

Primary author: Dr PERILLO-MARCONE, Antonio (CERN)

Co-authors: Mr STEYAERT, Didier (CERN); Mr HUMBERT, Jerome (CERN); Dr BRIZ MONAGO, Jose Antonio (CERN); Dr CALVIANI, Marco (CERN); Dr SGOBBA, Stefano (CERN)

Presenter: Dr PERILLO-MARCONE, Antonio (CERN)

Session Classification: Session 7-Operation of Targets and Beam Dumps

Track Classification: 7-Operation of Targets and Beam Dumps