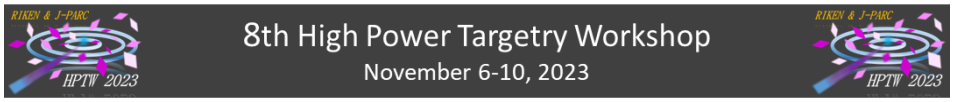

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Beam Intercepting Devices for the High Intensity upgrade in CERN's SPS North Area facility

Tuesday, 7 November 2023 17:22 (1 minute)

CERN's Super Proton Synchrotron North Area (NA) is set to house a new high-intensity fixed-target facility, to be installed in the existing ECN3 Experimental Cavern. Beam delivery to this area relies upon several beam-intercepting devices located in various branched transfer lines from the SPS. These include the transfer line 'TED'dump and 'TCSC'splitter protection collimators in the NA beamlines, followed by primary production target systems of beryllium plates and subsequently by a combined collimation, attenuation and dump device made from a set of aluminium, copper and iron blocks and known as a 'TAX'(Target Attenuator [for] eXperimental areas).
These protection-devices which must be capable of withstanding a few high intensity pulses are to be refurbished or installed as new elements. These may operate in a range of configurations depending on experimental needs. Future operational regimes with higher beam intensities (increased from a current specification of 1.5 × 10^13 to 4.0 × 10^13 ⊠+/pulse), shorter pulse times (4.8 s reduced to 1.2 s), greater repetition rates (14.4 s cycle time reduced to 7.2 s) and ten times the annual intensity place more stringent thermo-structural demands beyond their original specification.
This contribution provides an overview of the different beam-intercepting devices and the respective engineering challenges associated with the high-intensity upgrade proposed for CERN's North Area ECN3.

Themes for the contribution

4 Target design, analysis, and validation of concepts:

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