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Overview of the automated spill regulation at the SPS

The CERN Super Proton Synchrotron (SPS) plays a crucial role in the CERN Fixed Target (FT) physics program by extracting proton beams towards the North Area (NA) targets. In order to gradually deliver the proton beams to the three primary NA targets, slow extraction is performed by approaching the third order resonance in the SPS, and the spill is eventually split on two vertical splitters upstream of the targets. To enhance the efficiency of the extraction and maximize the duty factor, a set of algorithms has been developed and integrated into the SPS operation controls system. These algorithms automatically regulate the target symmetry, intensity, and flatten the spill structure in real-time. This presentation outlines the functionalities of these tools and highlights their operational benefits for the FT physics. Finally, an outlook on the future evolution of these algorithms and their potential integration into an operational framework is given.

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