Contribution ID: **1462** Contribution code: **TUPS32**   Type: **Poster Presentation**

Intensity reach of the barrier-bucket multi-turn transfer for fixed-target proton beam from PS to SPS

Tuesday, 21 May 2024 16:00 (2 hours)

Fixed target beams are extracted in five turns from the Proton Synchrotron (PS) at CERN to fill almost half the circumference of the Super Proton Synchrotron (SPS) with each transfer. To avoid beam loss during the risetime of the extraction kickers a longitudinal gap is generated with an RF barrier-bucket scheme. However, the synchronization of the gap with the PS extraction and SPS injection kickers requires the RF system to operate without any beam feedback during the transverse splitting process at the flat-top. Low RF voltage is moreover required during the process to keep a small momentum spread. Both conditions are unfavorable for longitudinal stability and a campaign of beam measurements has been performed to explore potential intensity limitations. Up to 3.3e+13 protons have been accelerated and remained longitudinally stable at high energy. Longitudinal coupled-bunch instabilities occurring at the intermediate plateau below transition energy are moreover cured by a dipole-mode feedback system initially developed for LHC-type beams. The contribution summarizes the results of the beam tests, probing the limits of the fixed-target proton beam production.

Footnotes

Funding Agency

Paper preparation format

LaTeX

Region represented

Europe

Primary author: DAMERAU, Heiko (European Organization for Nuclear Research)

Co-authors: HUSCHAUER, Alexander (European Organization for Nuclear Research); LASHEEN, Alexandre (European Organization for Nuclear Research); CUVELIER, Matis (European Organization for Nuclear Research); VADAI, Mihaly (European Organization for Nuclear Research); PREBIBAJ, Tirsi (European Organization for Nuclear Research)

Presenter: PREBIBAJ, Tirsi (European Organization for Nuclear Research)

Session Classification: Tuesday Poster Session