



Contribution ID: 224

Type: Poster

The LIU Project: Vacuum performance simulation of the upgraded PS complex

Tuesday 19 June 2018 18:00 (20 minutes)

The injector chain of LHC is being upgraded to achieve the beam quality required for the High-Luminosity LHC ($5 \times 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$). To achieve that performance the injectors have to provide beams of double intensity and 2.5 times the present brightness.

The LHC Injectors Upgrade project (LIU) requires the connection of the new proton source (LINAC4) that will provide negative hydrogen ions at 160 MeV instead of protons at 50 MeV. This new injection will require the complete refurbishment of the injection line to PSB synchrotron to strip the negative ions and accelerate the beam to 2 GeV instead of actual 1.4 GeV. This increase also requires the rearrangement of the PS synchrotron injection. All these modifications will have a significant impact on the vacuum layout and performance. This contribution illustrates these modifications and the expected vacuum performance after their implementation.

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Session Classification: Poster Session Tuesday

Track Classification: Vacuum in Accelerators