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Can we ever reach the HL-LHC requirements with the injectors (LIU)? (30' + 10')

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Abstract:

The present intensity and brightness limitations of the LHC injector synchrotrons for 25 ns beams are space charge, beam loading, instabilities in the transverse and longitudinal planes and electron cloud effects. This paper reviews how these performance limitations are expected to change after implementing the mitigation measures foreseen within the Upgrade Scenario 2. The question is addressed whether the beam performance will match the requirements of the HL-LHC project. In particular, we assume operational scenarios with 25 ns beams produced with the traditional bunch splitting scheme in the PS and with the already tested batch compression scheme beams. A set of baseline parameters at LHC injection is then established based on extrapolation from the beam characteristics achieved in 2012 and the expected gains from the upgrades.

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Session Classification: Session 4 - Upgrade scenario 2 (decoupled from scenario 1)