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Performance potential of the injectors after LS1

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The main upgrades of the injector chain in the framework of the LIU project will only be implemented in the second long shutdown (LS2), in particular the increase of the PSB energy to 2 GeV or the implementation of cures/solutions against instabilities/e-cloud effects etc. On the other hand, Linac4 will become available by the end of LS1. Its connection to the PSB can then take place either on short notice if Linac2 fails, taking 50 MeV protons in the PSB via the existing injection system but with reduced performance, or from the end of 2015 during a prolonged winter shutdown before LS2. The anticipated beam performance of the LHC injectors after LS1 in these different cases is presented. Space charge on the PS flat-bottom will remain a limitation because the PSB to PS transfer energy will stay at 1.4 GeV. Therefore new RF manipulations are presented which will improve brightness for 25 ns bunch spacing and should allow for more than nominal luminosity in the LHC.

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