

CERN Upgrade Plans for the LHC and its Injectors

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The primary goal of CERN and the LHC community is to ensure that LHC is operated efficiently, that it achieves nominal performance in the shortest term, and that its performance steadily improves. Since several years the community has been discussing the directions for maximizing the physics reach of the LHC by upgrading the experiments, in particular ATLAS and CMS, the LHC machine and the CERN proton injectors, in a phased approach. The first phase comprises construction of LINAC4 and the LHC IR upgrade, with the goal of increasing the LHC luminosity to 2 to 3 10^{34} cm⁻²s⁻¹, while maximising the use of mature magnet technologies and of the existing infrastructure. These two projects were approved by Council in December 2007 and are scheduled for completion, together with ATLAS and CMS upgrades, in 2014. The second phase foresees further substantial improvements in the injector chain, with replacement of the aging PS and its booster with SPL and PS2, modifications in the existing SPS, and finally with significant modifications of the magnet technology for the LHC interaction regions and upgrade of the infrastructure. Completion of this phase around 2020 should allow to increase further the luminosity of the LHC towards 10^{35} cm⁻²s⁻¹. In this report, a summary is given of the on-going projects and studies for the upgrade of the LHC and its injectors.

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