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Early Beam Injection Scheme for the Fermilab Booster: A Path for Intensity Upgrade

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After the shutdown of the Tevatron, Fermilab has shifted focus to the intensity frontier and is committed to increase the average beam power to the neutrino and muon programs. Many upgrades to the existing injector accelerators are in progress under the Proton Improvement Plan (PIP). Proton Improvement Plan –II proposes to build an 800 MeV LINAC (that adopts super conducting RF technology) adding to the existing facility in the complex. In any case, the Fermilab Booster, an 8 GeV injector to 120 GeV Main Injector, is going to play very significant role for nearly next two decades. In this context, very recently we have proposed a new beam injection scheme called "early injection scheme" for the Fermilab Booster that has a high potential to increase the beam intensity output from the Booster, resulting in increased beam power to the HEP experiments. The scheme, if implemented, could also help improve the slip-stacking efficiency in the MI/RR with further gains in beam power. Here we present results from recent beam studies, current status of operational implementation and future plans for the early beam injection scheme.

Oral or Poster Presentation

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