

Design and performance of the LLRF system for the NOvA upgrade to the Fermilab Recycler and Main Injector

The NOvA project at Fermilab upgrades the existing NuMI neutrino beam to accommodate proton beam intensities of 700KW. The doubling of beam power is achieved by splitting up the task of slipstacking and subsequent acceleration of proton bunches between two machines. The first, a permanent magnet machine called the Recycler slipstacks 12,8 GeV proton bunches, to 6 slipstacked bunch pairs which are transferred and captured in a second machine called the Main Injector where they are accelerated to 120 GeV. The LLRF system for both machines must meet tight timing requirements to minimize beam loss and emittance growth. A design of the LLRF system for the two machines is described along with the special features used in the LLRF distributed control system hardware and software to meet the requirements for the project. The results of the operation with beam are also presented.

Primary author: VARGHESE, Philip (Fermi National Accelerator Laboratory)

Co-authors: BARNES, Barry (Fermi National Accelerator Laboratory); CHASE, Brian (Fermi National Accelerator Laboratory); VANDER MUELEN, David (Fermi National Accelerator Laboratory)

Presenter: VARGHESE, Philip (Fermi National Accelerator Laboratory)