

Neutrino Beam Instrumentation (NBI) for LBNF

The upcoming Long Baseline Neutrino Facility (LBNF) will generate a world-leading neutrino beam. The baseline beamline design involves a 1.2-MW, 120-GeV primary proton beam directed at a cylindrical graphite target, measuring 1.8 m in length and 16 mm in diameter. Three magnetic horns, supported inside horn 1, focus the hadrons produced in the target using 300kA currents. Additionally, there is a 194 m helium-filled decay pipe and a hadron absorber in the setup. To achieve the desired DUNE physics goals, it is essential to maintain tight constraints on beam systematics by aligning beamline elements, ensuring beam stability, and accurate targeting. The LBNF Neutrino Beam Instrumentation (NBI) group is responsible for aligning and monitoring the secondary and tertiary beams within the beamline. NBI performs beam-based alignment and monitoring of the neutrino beam intensity and direction, while also independently measuring the positions of the focusing horns. This poster aims to provide detailed descriptions and the current status of these instrumentation systems.

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