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Survey and Alignment of the Fermilab Booster Accelerator

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ABSTRACT

Survey and Alignment of the Fermilab Booster Accelerator

The Fermilab's Booster accelerator is the lowest energy level synchrotron at Fermilab. The Booster accepts the 400 MeV protons from Linac, accelerates to 8 GeV and sends it to the Main Injector. The Booster, which was originally built in 1970, is a circular accelerator of about 472 meters in circumference with a 24-fold period lattice. Each period has a 6-meter long straight section and a 1.2-meter short straight drift section, and 4 combined function magnets, two horizontally focusing (F magnet) and two horizontally defocusing (D magnet). Each dipole has four fiducials. The Booster also consists of 19 RF cavities, several BPMs and other components. In 2004, a decision was made to upgrade the survey and alignment technology for the Booster and this led to the establishment of a Booster Network (BooNet). This paper discusses the surveying and alignment methodology employed to survey the Booster Accelerator.

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