OTR DETECTORS FOR INTENSE PROTON AND ANTIPROTON BEAMS AT FNAL

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Abstract

Fermi National Acceleratory Laboratory (FNAL) is developing Optical Transition Radiation (OTR) detectors for proton and antiproton beam profile monitors. These OTR detectors are part of the collider Run II upgrade program and the NuMI primary proton beamline. The OTR detectors utilize radiation-hardened CID cameras and variable optics to measure 120 GeV protons and 150 GeV antiprotons over a wide range of beam intensities in both beam directions. This talk will discuss the resolution and 2-D imaging advantages of these detectors over standard wire detectors. Also presented are recent results from our production OTR detectors and measurements from our prototype OTR detector that was used to measure beams of up to 5·1012 120 GeV protons at 0.5 Hz. Different type of transition foils are discussed for operation over intensity range of ~5·109 to over 1·1013 particles per pulse.

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