

Abstract Submitted
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Generating a Reduced-energy Antiproton beam using Channeling Electrostatic elements (GRACE)¹ GERARD LAWLER, Boston Univ, NICOLA PACIFICO, CERN, AEGIS COLLABORATION — A device was designed for Generating a Reduced-energy Antiproton-beam using Channeling Electrostatic elements (GRACE). A series of einzel lenses and electrodes are used to create a slow beam of antiprotons with tunable mean energy (0 to 16 keV with root mean squared value below 20%) using antiprotons (mean energy of 5 MeV) from the Antiproton Decelerator (AD) at CERN. Degradation foil is in place, so GRACE further deflects the beam bunches away from the annihilation products, focusing them on a 14 mm x 14 mm detector. Manufacturing parameters were found using simulations written in C++. The device is currently in use by the Antihydrogen Experiment: Gravity, Interferometry, Spectroscopy (AEGIS) collaboration at CERN, which seeks to measure the sign of the gravitational constant for antimatter by performing interferometry studies on an antihydrogen beam. GRACE delivers on the order of 10 events per beam bunch from the AD. Antiprotons will eventually be used together with a pulse of positronium atoms to make antihydrogen atoms with horizontal velocity. GRACE is being used to perform intermediary experiments concerning interferometry of antiprotons, an important stepping stone on the way to measuring the sign of gravity.

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