

Abstract Submitted
for the APR14 Meeting of
The American Physical Society

Latest Results from the Gamma Ray Polarimeter Experiment (GRAPE)¹ MARK MCCONNELL, PETER BLOSER, CAMDEN ERTLEY, JASON LEGERE, JAMES RYAN, SAMBID WASTI, University of New Hampshire — The Gamma RAY Polarimeter Experiment (GRAPE) is a balloon borne instrument designed for measuring the polarization of sources from 50-500 keV. It was first flown on a 26-hour balloon flight in the fall of 2011 from Ft. Sumner, NM. The payload consists of an array of independent Compton polarimeter modules based on scintillation technologies. The ultimate goal of our program is to operate GRAPE in a wide FoV configuration on a LDB flight to study GRBs. For the first balloon flight, GRAPE was configured in a collimated mode to facilitate observations of known point sources so that the polarization measurement capability of GRAPE could be demonstrated. The Crab nebula/pulsar, the active Sun, and Cygnus X-1 were the primary targets for the first flight. Although the Crab was detected, the polarization sensitivity was worse than expected, in part because of a lower-than-expected altitude for much of the flight. Only upper limits on the Crab polarization were obtained. Two M-class solar flares were also observed, with null results that indicate less than 30% polarization levels. This paper will describe the GRAPE payload, review the latest results from the first balloon flight, and present plans for the next GRAPE balloon flight, scheduled to take place in the fall of 2014.

¹This work is supported by NASA Grant NNX13AB96G.

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Date submitted: 10 Jan 2014

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