

Abstract Submitted  
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**Prototype Flight for the GAPS Experiment, An Indirect Search for Dark Matter** TRACY ZHANG, UCLA, GAPS COLLABORATION — The General Antiparticle Spectrometer (GAPS) is a balloon-based instrument designed to detect low energy ( $<1.0$  GeV/n) anti-deuterons in cosmic rays. These anti-deuterons can be signature for neutralino dark matter annihilation, and the low energy spectrum has very little anti-deuteron background. The first GAPS science flight is planned for 2014, and a prototype (pGAPS) will fly in 2011 from Japan. pGAPS is equipped with Si(Li) trackers, a time-of-flight system, on-board readout electronics, and a flight computer. The tracker system consists of three Si(Li) layers, which will operate at  $-35^{\circ}\text{C}$ . The goal is to detect de-excitation X-rays from exotic atoms formed by a stopped anti-deuteron and silicon nucleus. The energy resolution will be 3 keV for these X-ray energies. The time-of-flight (TOF) system consists of three layers of scintillation counters, with each layer consisting of two crossed planes of three counters. Each counter is read out on both ends by photomultiplier tubes. The TOF will have a time resolution better than 500ps and it will also provide charge measurement. The pGAPS flight will demonstrate functionality of the various detector components at balloon altitude 33km and pressure, as well as to test the thermal model implemented in detector cooling. The prototype will also provide a measurement of the antiparticle background level at balloon altitude.

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