Current progress and future plans for the general antiparticle spectrometer (GAPS)

H. Fuke (1), T. Yoshida (1), T. Aramaki (2), C. Hailey (2), J. Koglin (2), H. Yu (2), F. Gahbauer (3), K. Mori (4), W. Craig (5), N. Madden (5) and K. Ziock (6)

 ISAS/JAXA, Kanagawa, Japan, (2) Columbia University, New York, USA, (3) University of Latvia, Riga, Latvia, (4) Canadian Institute for Theoretical Astrophysics, Toronto, Canada, (5) Lawrence Livermore National Laboratory, California, USA, (6) Oak Ridge National Laboratory, Tennessee, USA. fuke@balloon.isas.jaxa.jp / Phone: +81-42-759-8237 /

We discuss current progress and future plans for the general antiparticle spectrometer experiment (GAPS). GAPS detects antideuterons through the X-rays and pions emitted during the deexcitation of exotic atoms, formed when the antideuterons are slowed down and stopped in targets. GAPS provides an exceptionally sensitive means to detect antideuterons. Cosmic antideuterons can provide indirect evidence the for the existence of dark matter in such form as neutralinos or Kaluza-Klein particles. We describe results of accelerator testing of GAPS prototypes, tentative design concepts for a flight GAPS detectors, and near term plans for flying a GAPS prototype on a balloon.