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GAPS: A search for dark matter signals in cosmic ray antinuclei

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The sub-GeV spectrum of cosmic ray antinuclei is a largely unexplored hunting ground for products of dark matter decay or annihilation. Because the conventional astrophysical background is extremely low, detection of even a few antideuterons in this regime would be a strong hint of a dark matter source. Meanwhile, measuring the low-energy antiproton spectrum will constrain both dark matter models and parameters of cosmic ray propagation. The General Antiparticle Spectrometer (GAPS) will perform the first measurements of this kind using the novel technique of exotic atom identification. Currently, the GAPS collaboration is developing the large, lithium-drifted silicon detectors that are key to this technique. GAPS is scheduled for deployment on long-duration balloon flight over Antarctica in late 2020.

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