Contribution ID: **124** Type: **Parallel talk**

The GAPS experiment: low energy cosmic-ray antinuclei for indirect dark matter searches

Thursday, 11 July 2024 15:40 (20 minutes)

The General Antiparticle Spectrometer (GAPS) is a balloon-borne experiment designed to perform low-energy cosmic-ray antinuclei measurements searching for indirect signatures of dark matter. A wide range of well-motivated dark matter models predicts antideuteron and antihelium fluxes about two orders of magnitude above the expected astrophysical background below 250 MeV/n. Thanks to a novel identification technique based on the formation of an exotic atom and its de-excitation and decay, GAPS will achieve an unprecedented sensitivity for low-energy antideuteron and antihelium nuclei fluxes.
The GAPS experiment will perform three long-duration balloon flights over Antarctica, the first of which is planned for the 2024/2025 Austral summer. The experimental apparatus consists of a Si(Li) tracker surrounded by a time-of-flight system made of plastic scintillator paddles. This contribution will illustrate the scientific potential of the GAPS experiment and its impact on indirect dark matter searches.
Then, the final phases of the integration, calibration, and the results of the system's ground tests will be discussed in view of the launch from the Mc Murdo Antarctic base in December 2024.

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Session Classification: Parallel 2

Track Classification: Parallel session: Indirect detection