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Neural Networks aproach to event reconstruction for the GAPS experiment

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The General Antiparticle Spectrometer (GAPS) is a balloon-borne detector, whose first flight is scheduled in the austral summer 2022,and is designed to measure low energy (<0.25 GeV/n) cosmic antinuclei. A particular focus is on antideuterons, which are predicted to have an ultra-low astrophysical background as compared to signals from dark matter annihilation or decay in the Galactic halo. GAPS uses a novel technique for particle identification based on the formation and decay of exotic atoms. To achieve sufficient rejection power for particle identification, an accurate determination of several fundamental quantities is needed. The precise reconstruction of the energy deposition pattern on the primary track is a particularly intricate problem and we exhibit a strategy devised to solve this using modern machine learning techniques. In the future, this approach can be used for particle identification. Here, we present preliminary results of these efforts obtained from simulated data.

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