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## A Study of Astrophysical Backgrounds of Antihelium Nuclei in Cosmic Rays

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Presence of larger antinuclei (i.e. antideuterons, antihelium) in the cosmic rays (CR) can be smoking gun signatures of indirect detection of Dark Matter (DM) annihilations. Recent reports of antihelium nuclei candidate events by AMS-02 experiment have generated interest in the community. However, lack of observations of antideuterons in CR so far have opened up questions about possible astrophysical backgrounds and their propagation in antinuclei measurements. In this study we explore the possibilities of producing antihelium nuclei from CR (mostly) protons with different energies and interstellar medium (ISM - mostly hydrogen) via the coalescence mechanism using the EPOS-LHC hadronic event generator and an afterburner. In comparison to simplified analytical methods, this way the correlations between the constituent nucleons are taken into account. This technique applied the coalescence condition on a event-by-event basis. Different methods of combining multiple nucleons to form larger antinuclei were considered. The analysis is highly computation intensive given the rare nature of antihelium production in  $p + p$  interactions. Source terms for the galactic propagations of the antihelium were determined and compared with current literature. Preliminary results of the propagation are also going to be presented.

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