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Cosmic antimatter signatures from primordial back holes

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In this talk, we present our study of the cosmic antiproton and antideuteron fluxes produced by the evaporation of galactic primordial black holes (PBHs). The antimatter production spectra were obtained using our modified version of the BlackHawk code, which incorporates a state-of-the-art Wigner function coalescence model for antideuteron formation. The propagation of these fluxes throughout the Galaxy is computed with the USINE code, employing the latest cosmic-ray propagation frameworks. Using a realistic treatment of theoretical uncertainties and experimental errors, we compared our predicted antiproton fluxes with AMS-02 measurements and background predictions and we derived competitive bounds on the abundance of PBHs in the window of critical masses of 10^{12} to 10^{18} grams, limiting the parameter space for PBHs as Dark Matter candidates. Finally, we compared the predicted antideuteron fluxes with the expected sensitivity of the GAPS experiment, to probe its potential to detect antideuterons of PBH origin.

Collaboration(s)

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