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Toward a universal coalescence model for antideuteron production

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Cosmic antideuterons offer a unique window for dark matter searches, but their prediction still suffers from uncertainties in coalescence models. A recent Wigner-function-based approach using the Argonne v_{18} wave-function has greatly improved the modeling of antideuteron production from dark matter annihilation and decay. In this talk, we introduce a new project, still at an early stage, which aims to test the same coalescence framework in proton-proton collisions relevant for the secondary production of antideuterons in the Galaxy. Our goal is to assess the possible universality of coalescence parameters across different production processes and energy regimes. This would help improve the reliability of background estimates in future searches with GAPS and AMS-02.

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