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Antisymmetric tensor portals to dark matter

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Both freeze-in of very weakly coupled dark matter and freeze-out of initially thermalized dark matter from the primordial heat bath provide interesting possibilities for dark matter creation in the early universe. Both scenarios allow for a calculation of baryon-dark matter coupling constants as a function of dark matter mass m_{χ} , $g = g(m_{\chi})$, due to the constraint that freeze-in or freeze-out produce the observed dark matter abundance. Here we compare the resulting coupling constants in the two scenarios if dark matter couples to baryons through an antisymmetric tensor portal. The freeze-in scenario predicts much smaller coupling in agreement with the nonthermalization postulate. We find that the couplings as a function of mass behave very differently in the two scenarios.

Keyword-1

Dark Matter

Keyword-2

Antisymmetric tensor portals

Keyword-3

WIMPs

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