

Cosmic-ray and gamma-ray constraints on dark matter stability

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Abstract content

We examine different constraints on dark matter stability from cosmic-ray and gamma-ray observations and their complementarity through higher-order effects. Two and three-body decays of dark matter particles into charged leptons and quarks generically induce decays into monochromatic photons at the quantum level. We present a general model-independent analysis of hadronic constraints in the mass-lifetime parameter space and compare those constraints to current and projected limits on gamma-ray lines. We also discuss how the production of monochromatic photons can be enhanced by kinematic effects, potentially giving rise to observable lines in the gamma-ray sky.

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