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Mineral Detection of Cosmic-Ray Boosted Dark Matter

Wednesday, April 15, 2026 11:15 AM (30 minutes)

We present the first dedicated analysis of cosmic-ray boosted dark matter (CRDM) in paleo detectors. Owing to their large kinetic energies, CRDM particles generate nuclear-recoil tracks that extend to substantially larger lengths than those produced by dominant backgrounds from neutrinos and intrinsic radioactivity. Combined with the ultra-large effective geological exposure of 10^5 tyr, paleo detectors provide a uniquely sensitive probe of sub-GeV DM. Considering both constant and vector-mediator interactions, we find that paleo detectors improve the sensitivity to the DM-proton scattering cross section by one to two orders of magnitude compared with the latest XENONnT limits.

Do you plan to give the talk in person?

No

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