

Search for Cosmic-Ray Produced Light Dark Meson at JUNO Detector

Null results from WIMP searches motivate light sub-GeV dark sectors, whose low-mass nuclear recoils evade conventional direct detection. Cosmic-ray collisions in the atmosphere produce relativistic dark mesons that overcome this kinematic barrier. This talk focus on a confining dark sector (Dark QCD) with $N_f=3$ flavors coupled to the SM via a leptophobic $U(1)_D$ vector portal. Dark quarks produced through proton bremsstrahlung, pion/eta meson decays, and Drell-Yan processes hadronize into dark mesons via a Modified Quark Combination Model. Portal-coupled K_D mesons scatter in the JUNO detector, simulated with GENIE under a conservative LES-inspired selection.

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