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Fermionic Dark Matter in a Scotogenic Model with a Complex Scalar Singlet

Thursday, 3 December 2026 15:30 (20 minutes)

We study the phenomenology of the complex scoto-singlet model, an extension of the scotogenic framework that simultaneously accounts for radiative neutrino masses and fermionic dark matter. We perform a Markov Chain Monte Carlo scan of the parameter space, imposing theoretical consistency together with constraints from neutrino oscillation data, lepton-flavor violation, collider searches and the observed dark matter relic abundance. Viable dark matter solutions are found both near the Higgs resonance and in coannihilation regions, extending the allowed mass range with respect to the minimal scotogenic model. Direct- and indirect-detection signals are strongly suppressed, placing most of the viable parameter space beyond the reach of current experiments. At colliders, monojet searches offer the best prospects to probe our model in compressed-spectrum scenarios, while long-lived charged scalars may give rise to displaced or detector-stable signatures.

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