

WIMP phenomenology in Dilatonic Einstein Gauss-Bonnet Cosmology

Wednesday, 14 June 2023 17:15 (20 minutes)

We use the Weakly Interacting Massive Particle (WIMP) thermal decoupling scenario to probe Cosmologies in dilatonic Einstein Gauss-Bonnet (dEGB) gravity, where the Gauss-Bonnet term is non-minimally coupled to a scalar field with vanishing potential. We show that when the WIMP relic density is constrained to match the observed DM abundance in the Universe the ensuing modified cosmological scenario can drive the required WIMP annihilation cross section to Standard Model particles beyond the present bounds from DM indirect detection searches, allowing to constrain the model parameters. The bounds from WIMP indirect detection are nicely complementary to late-time constraints from compact binary mergers, suggesting that it could be interesting to use other Early Cosmology processes to probe the dEGB scenario.

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Session Classification: Wednesday afternoon session