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Dark Matter Phenomenology in an Extended Littlest Seesaw Model and Effects of Primordial Black Hole

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We consider an extension of Littlest Seesaw model with an additional scalar and a fermionic particle under the freeze-in scenario. Primordial black hole of a certain mass range can act as an alternate production mechanism for the dark matter particles as it evaporates via Hawking radiation. Furthermore, the presence of a primordial black hole with substantial energy density gives rise to non-standard cosmology which also modifies the freeze-in production. We have investigated this freeze-in scenario in presence of primordial black hole for a few interesting cases and constrained the parameter space accordingly. If the universe is primordial black hole dominated at any point before Big Bang Nucleosynthesis, we have found that the final relic in that case is constituted mostly by the evaporation component in the high dark matter mass and by the freeze-in component in the low dark matter mass.

Session

Astroparticle Physics and Cosmology

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