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Sneutrino Inflation with Asymmetric Dark Matter

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The asymmetric dark matter scenario is known to give an interesting solution for the cosmic coincidence problem between baryon and dark matter densities. In the scenario, the dark matter asymmetry, which is translated to the dark matter density in the present universe, is transferred from the B-L asymmetry generated in the early universe. On the other hand, the generation of the B-L asymmetry is simply assumed, though many mechanisms for the generation are expected to be consistent with the scenario. We show that the generation of the asymmetry in the sneutrino inflation scenario works similarly to the asymmetric dark matter scenario, because the non-renormalizable operator which translates the B-L asymmetry to the dark matter asymmetry is naturally obtained by integrating right-handed neutrinos out. As a result, important issues concerning cosmology (inflation, the mass density of dark matter, and the baryon asymmetry of the universe) as well as neutrino masses and mixing have a unified origin, namely, the right-handed neutrinos.

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