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Supersymmetry and dark matter extensions of Higgs-R2 model

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Recently, the Higgs-R2 inflation model has been intensively studied as a UV completed model of Higgs inflation. In this talk, we discuss two directions on extensions of this model. One is supersymmetric embedding of the Higgs-R2 inflation, which provides a further UV completion. We investigate several conditions for the original successful inflation to be kept after supersymmetrization, and also discuss supersymmetry breaking and its phenomenological consequence. Another direction is DM extension. Adopting a singlet scalar dark matter, we discuss the freeze-in production of dark matter both from the non-thermal scattering during reheating and the thermal scattering after reheating.

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