

Two component dark matter models: combined particle physics and cosmological approach

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We explore the possibility of incorporating particle physics motivated scalar fields to the dark matter cosmological model. We consider two scalar fields, one that does not interact in any way, except via the gravitational interaction, with the rest of the matter in the Universe (which we denote as classical). The second scalar is a BSM field, which can be either a Higgs-like or an axion-like field. Then, both the classical and the BSM fields would contribute to the dark matter relic density observed today, and we explore which proportions of each field today are consistent with BBN in the early Universe. We motivate this kind of approach through flavour models where more than one particle candidate to dark matter exists, allowing for a combined cosmological and particle physics approach.

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