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Quartic couplings in Inert Doublet Model and Dark Matter data

We analyse the thermal evolution of the Universe in the Inert Doublet Model for known three regions of Dark Matter masses: low mass (4 - 8) GeV, medium mass (30 - 80) GeV and high mass (500 - 1000) GeV. We argue that those three regions of DM mass exhibit different behaviour, both in the possible types of evolution and in the energy relic density values. We use use the masses of the scalar particles as the input parameters to constrain the two self-couplings between neutral scalars. We argue, that the astrophysical data along with the positivity constraints should be used to simultaneously constrain both triple and quartic self-couplings.

Based on arXiv:1009.4593 - I. F. Ginzburg, K.A. Kanishev, M. Krawczyk, D. Sokolowska, arXiv:1104.3326, arXiv:1107.1991 - D. Sokolowska

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