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Dark matter phenomenology in the Inert Zee Model

In this work we have explored the phenomenology of dark matter in the Inert Zee Model (IZM), which is an extension of the standard model that aims to solve simultaneously the dark matter problem and the neutrino masses and mixings, through the addition of new scalar and fermion fields, and the introduction of a Z_2 symmetry to stabilize dark matter. Since that the phenomenology of the IZM under certain limits is similar to that of the Inert Doublet Model (IDM), as a result, we have explored the two available regions of the IDM. In the first place, we analyzed the effect of each additional field on the IDM relic density. In the low mass regime we have recovered a portion of the parameter space that had been excluded by Direct Detection experiments (DD). This is due to new annihilation channels mediated by the new lepton which allows us to set the quartic coupling λ_L to be small. In the high mass regime, due to coannihilation processes of the new fields with the particle spectrum of IDM, we recovered a region around of 360 GeV for the mass of the DM, satisfying the relic density constraint. Additionally, the predicted Indirect Detection (ID) signals are improved.

Author: Mrs GAVIRIA, Alexandra (Universidad de Antioquia)

Presenter: Mrs GAVIRIA, Alexandra (Universidad de Antioquia)

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