MOCa 2022: Materia Oscura en Colombia



Contribution ID: 11

Type: not specified

Fermion and scalar two-component dark matter from a Z4 symmetry

Tuesday 31 May 2022 09:45 (45 minutes)

We study a two-component dark matter model in which the dark matter particles are a singlet fermion (ψ) and a singlet scalar (S), both stabilized by a single Z4 symmetry. The model is remarkably simple, with its phenomenology determined by just five parameters: the two dark matter masses and three dimensionless couplings. In fact, S interacts with the Standard Model particles via the usual Higgs-portal, whereas ψ only interacts directly with S, via the Yukawa terms $\psi c(ys + yp\gamma5)\psi$ S. We consider the two possible mass hierarchies among the dark matter particles, MS < M ψ and M ψ < MS , and numerically investigate the consistency of the model not only is compatible with all known constraints, but that it also gives rise to observable signals in future dark matter experiments. Interestingly, both dark matter particles may be observed in direct detection experiments while the most relevant indirect detection channel is due to the annihilation of ψ . We also argue that this setup can be extended to other ZN symmetries and additional dark matter particles.

Author: YAGUNA, Carlos E.

Presenter: YAGUNA, Carlos E.