

Signatures of Synchrotron Radiation from the Annihilation of Dark Matter at the Galactic Centre

Monday 4 February 2019 14:00 (30 minutes)

We propose a fermionic dark matter model by extending Standard Model with a Dirac fermion and a real pseudoscalar. The fermion dark matter particle interacts with the Standard Model sector via the Higgs portal through a dimension five interaction term as also through a pseudoscalar interaction term. The parameter space of the model is then constrained by using the vacuum stability and perturbativity condition as also with the LHC constraints. They are finally constrained by the PLANCK results for dark matter relic densities. The direct detection limits are then ensured to have satisfied by the model. We then explore within the framework of the model, the possible signatures of synchrotron radiation from the annihilations of dark matter in the Galactic Centre region when the end product is e^+e^- . We consider the observational data from the radio telescopes namely SKA, GMRT and Jodrell Bank telescopes and compare our calculated synchrotron flux density with them and also with the results predicted by these experiments. We predict that the low frequency radio telescopes like GMRT, SKA, if operate at the peak frequencies obtained from our calculations should get a better r.m.s sensitivity.

Authors: Prof. MAJUMDAR, Debasish (Astroparticle Physics and Cosmology Division, Saha Institute of Nuclear Physics, HBNI 1/AF Bidhannagar, Kolkata 700064, India); Mr PAUL, Avik (Astroparticle Physics and Cosmology Division, Saha Institute of Nuclear Physics, HBNI 1/AF Bidhannagar, Kolkata 700064, India)

Co-author: Dr DUTTA BANIK, Amit (Department of Physics, Indian Institute of Technology, Guwahati 781039, India)

Presenter: Prof. MAJUMDAR, Debasish (Astroparticle Physics and Cosmology Division, Saha Institute of Nuclear Physics, HBNI 1/AF Bidhannagar, Kolkata 700064, India)

Session Classification: Parallel Session Particle Physics