



Contribution ID: 22

Type: oral

Dark matter searches using cosmic ray antiprotons

Wednesday, March 27, 2019 12:05 PM (20 minutes)

The cosmic-ray (CR) antiprotons, which primarily come from the inelastic collisions between the CR protons (and helium) and the interstellar medium, are effective to constrain the dark matter (DM) models.

The background parameters about the propagation, source injection, and solar modulation are based on results inferred from newest AMS-02 and Voyager data, and on the cross section of antiproton production from new collider data. We use a Bayesian approach to consider the uncertainties of both the background and the DM annihilation components of antiprotons. We find that including a component of antiprotons from DM annihilation can improve the fit to the AMS-02 antiproton data considerably.

Furthermore, based on the effective field theory approach, we also investigate the compatibility of the DM interpretation of the AMS-02 antiproton excess and the null results from direct detection experiments, LUX, PandaX-II, and XENON1T.

Primary author: Dr CUI, Mingyang (Purple Mountain Observatory)

Co-authors: Prof. YUAN, Qiang (Purple Mountain Observatory); Prof. FAN, Yizhong (Purple Mountain Observatory); Prof. TSAI, Yue-Lin Sming (Institute of Physics, Academia Sinica); Dr PAN, Xu (Purple Mountain Observatory)

Presenter: Dr CUI, Mingyang (Purple Mountain Observatory)