Contribution ID: **37** Type: **not specified**

Diffusive Propagation of Galactic Cosmic Rays in a Two Halo Scenario

Monday 19 October 2015 15:30 (45 minutes)

The study of antimatter particles in cosmic rays excites many physicists who believe in the possibility that these particles come from annihilation of dark matter particles. This possibility is very difficult to prove because antiparticles are also created
by collisions of ordinary cosmic rays with the interstellar medium. For example, collisions of energetic protons can produce antiprotons or positrons. Hence the level of antimatter arising from cosmic-ray collisions has to be calculated. However, calculations of antimatter production depend crucially on our knowledge of cosmic-ray propagation: what happen to cosmic rays when they propagate through the Galaxy?

In this work, I presents new calculations aimed to explain recent, conflicting observations on protons, nuclei, anisotropy, and gamma-rays. In contrast to standard calculations, I suggest that cosmic rays experience different propagation properties when traveling in different regions of the Galaxy. This possibility leads to a remarkably enhanced antimatter production. At the highest energies detectable by the AMS experiment, antiprotons and positrons are approximately 5 times more abundant. Current models describing antimatter data in terms of dark matter must also take into account this possibility, which will be tested soon by additional data expected to be released from AMS.

Author: TOMASSETTI, Nicola (Centre National de la Recherche Scientifique (FR))

Presenter: TOMASSETTI, Nicola (Centre National de la Recherche Scientifique (FR))

Session Classification: Poster Session