Contribution ID: **95** Type: **Talk**

Results overview from the DAMPE space mission in orbit

Wednesday 8 September 2021 14:50 (20 minutes)

The Dark Matter Particle Explorer (DAMPE), is a space–borne detector designed for precise galactic Cosmic Ray (CR) studies in a wide energy range (up to 100 TeV), along with detailed measurements of high–energy gamma–rays and indirect searches of Dark Matter (DM) annihilation/decay to detectable particles. The satellite was successfully launched into a sun–synchronous orbit at 500 km, on December 17th 2015 and has been successfully acquiring data ever since. The instrument consists of four sub-detectors, namely: a Plastic Scintillator Detector (PSD), a Silicon TracKer-converter (STK), a deep Bismuth Germanate (BGO) calorimeter (32 X_0, 1.6 λ_I) and a NeUtron Detector (NUD).
DAMPE provided valuable insight on the cosmic-ray electron+positron (CRE) spectrum, unveiling a clear spectral break at ~0.9 TeV with unprecedented energy resolution. Moreover, recent results regarding CR protons reveal a spectral hardening (at few hundred GeV) followed by a softening feature at ~10 TeV. These features are well described by a smoothly-broken power law (SBPL), which differs from the paradigm of a unique power law (PL) spectrum extending up to PeV energies, hence necessitating a careful reconsideration of prevailing CR models. Additional insights concerning spectral measurements of helium, medium (i.e, boron, carbon, nitrogen, oxygen) and heavier mass nuclei (iron), will be presented in this work. Preliminary results on secondary-over-primary ratios (i.e., B/C and B/O) detrimental in deciphering the nature of CR propagation in the Galaxy, will also be discussed, including a general synopsis of the mission status.

Primary author: KYRATZIS, Dimitrios (Gran Sasso Science Institute (GSSI) & INFN-LNGS)

Co-author: FOR THE DAMPE COLLABORATION

Presenter: KYRATZIS, Dimitrios (Gran Sasso Science Institute (GSSI) & INFN-LNGS)

Session Classification: Nuclear and particle astrophysics

Track Classification: Nuclear and particle astrophysics