

Local emission of cosmic ray electrons: multi-messenger constraints

Thursday, August 30, 2018 2:17 PM (0:17)

Abstract content

The inclusive flux of cosmic electrons and positrons is now known with unprecedented precision up to few tens of TeV. Very recent data from AMS-02, DAMPE, CALET, FERMI and HESS suggest that the flux starts deviating from a single power law at TeV energies, with the presence of a break at around 1 TeV. In addition, new stringent upper bounds on the dipole anisotropy of the inclusive flux have been presented from Fermi-LAT. We present a multi-messenger study of the emission from local Galactic sources, namely Supernova Remnants (SNRs). For the first time, we quantify the constraints imposed by the dipole anisotropy upper bounds on the properties of nearby known SNRs. We find a multi-component model that is compatible with the radio fluxes from Vela YZ and Cygnus Loop SNRs, explains the electron and positron flux measurements from five experiments and the dipole anisotropy data.

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Session Classification : Cosmic Rays

Track Classification : Cosmic Rays