Abstract number: S3-49
TeV anisotropy
30 min. invited talk

A unified solution to the anisotropy and gradient problem

Evoli, Carmelo[1]
[1]Hamburg University

The Fermi-LAT collaboration recently confirmed a discrepancy between the observed longitudinal profile of gamma-ray diffuse emission from the Galaxy and that computed with numerical codes assuming that Cosmic Rays (CRs) are produced by Galactic supernova remnants; the accurate Fermi-LAT measurements make this anomaly hardly explainable in terms of conventional diffusion schemes. At the same time, experimental data from both Muon detector and Extensive Air Shower experiments about the large scale dipole anisotropy of CRs can hardly be compatible with model predictions within the framework of isotropic and homogeneous propagation. We argue that, accounting for a well physically motivated correlation between the CR escape time and the spatially dependent magnetic turbulence power, it is possible to solve both problems at the same time in a very natural way. In fact, by exploiting this correlation we find propagation models that fit a wide set of CR primary and secondary spectra, and consistently reproduce the CR anisotropy in the energy range 10^2 - 10^4 GeV and the gamma-ray longitude distribution recently measured by Fermi-LAT.