Contribution ID: **162** Type: **Oral**

High-Energy Gamma-Rays from the Milky Way: Three-Dimensional Spatial Models for the Cosmic-Ray and Radiation Field Densities

Monday 7 August 2017 14:00 (15 minutes)

High-energy gamma rays of interstellar origin are produced by the interaction of cosmic-ray (CR) particles with the diffuse gas and radiation fields in the Galaxy. The main features of this emission are well-understood and are reproduced by existing CR propagation models employing 2D Galactocentric cylindrically symmetrical geometry. However, the high-quality data from instruments like the Fermi Large Area Telescope reveal significant deviations from the model predictions on few to tens of degree scales indicating the need to include the details of the Galactic spiral structure and thus require 3D spatial modelling. In this contribution the high-energy interstellar emissions from the Galaxy are calculated using the newly released version of the GALPROP code (v55) employing 3D spatial models for the CR source and interstellar radiation field (ISRF) densities. The interstellar emission models that include arms and bulges for the CR source and ISRF densities provide plausible physical interpretations for features found in the residual maps from high-energy gamma-ray data analysis. The 3D models for CR and ISRF densities provide a more realistic basis that can be used for refined interpretation of the non-thermal interstellar emissions from the Galaxy.

Author: PORTER, Troy (Stanford University)

Co-authors: MOSKALENKO, Igor (Stanford University); JOHANNESSON, Gudlaugar (University of Iceland and NORDITA)

Presenter: PORTER, Troy (Stanford University)

Session Classification: Cosmic rays

Track Classification: Cosmic rays