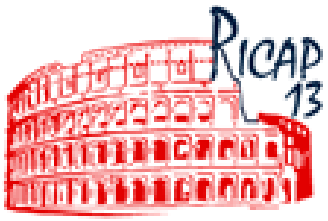

Contribution ID: **80** Type: **not specified**

Gamma rays from Fermi bubbles as due to diffusive injection of Galactic cosmic rays

Thursday, 23 May 2013 15:40 (15 minutes)

Recent detailed analysis of the Fermi-LAT data has discovered two giant gamma-ray emission regions, the so-called Fermi bubbles, extending up to ~ 50 degree in Galactic latitude above and below the Galactic center with a width of ~ 40 degree in longitude. The origin of the gamma-ray emission is not clearly understood. Suggested explanations include injection of cosmic-ray nuclei from the Galactic center by high-speed Galactic winds, electron acceleration by multiple shocks in the Galactic halo and stochastic electron acceleration inside the bubbles. Here, it is proposed that the gamma-rays can be the result of diffusive injection of Galactic cosmic rays during their propagation through the Galaxy. If the plasma inside the bubbles is extremely turbulent, the injected cosmic rays can undergo much slower diffusion inside the bubbles than in the averaged Galaxy, and at the same time, also suffer from inelastic collisions with the bubble plasma producing pion-decay gamma rays. It will be shown that this minimal model can explain many of the observed properties of the Fermi bubbles such as the measured intensity profile, the energy spectrum and the measured luminosity without invoking any additional particle production processes or sources other than those responsible for the production of bulk of the Galactic cosmic rays.

Primary author: Dr THOUDAM, Satyendra (Department of Astrophysics, Radboud University Nijmegen, Nijmegen, The Netherlands)

Presenter: Dr THOUDAM, Satyendra (Department of Astrophysics, Radboud University Nijmegen, Nijmegen, The Netherlands)

Session Classification: Parallel Session E