



Contribution ID: 264

Type: **Presentation**

Gamma-ray observations of the pulsar wind nebula 3C58 with the Fermi-Large Area Telescope

Wednesday, June 25, 2014 2:20 PM (15 minutes)

Successfully launched on June 11, 2008, the Large Area Telescope (LAT), aboard the Fermi Gamma-ray Space Telescope is sensitive to gamma-rays with energies from about 20 MeV to more than 300 GeV and covers the full sky every 3 hours. The improved sensitivity and the unprecedented statistics offered by the LAT in comparison to its predecessor EGRET enable the study of various classes of gamma-ray sources, such as pulsars and pulsar wind nebulae (PWNe).

Pulsars characterized by high rotational energy loss rates are likely to power PWNe and therefore provide excellent laboratories to study the acceleration and diffusion of relativistic particles in their surrounding environment.

Here we will report on the detection of high-energy gamma-ray emission from the PWN 3C58 surrounding the young and energetic pulsar PSR J0205+6449. In combination with current flux upper limits at TeV energies, we explore the origins for high-energy gamma-ray emission from the PWN. The LAT detection places an important constraint on emission models of the nebula, helping to constrain the age and energetics of the system.

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Session Classification: Gamma-Ray Astrophysics

Track Classification: Gamma-Ray Astrophysics