

Solar Energetic Particles (SEP), Solar Modulation and Space Radiation: New Opportunities in the AMS-02 Era #2

Contribution ID: 34

Type: **not specified**

The GeV-TeV Sun

Tuesday 25 April 2017 15:15 (25 minutes)

The Sun does not shine at GeV-TeV energies on its own power, but because Galactic cosmic rays (CR) interact with its matter and light. By observing and modeling these interactions in and near the Sun, one may learn about CR propagation in the inner heliosphere and in the solar atmosphere. In this talk, I will present observations and a set of ongoing calculations that sharpen our understanding of how the Sun interacts with CR. From data taken with Fermi-LAT, I will show that the Sun is a luminous source of gamma rays up to at least 100 GeV, with time variability up to at least 10 GeV that anti-correlates with the solar activity cycle. I will show how this result compares with theoretical models (spoiler alert: badly), and show how observations from ground-based gamma-ray telescopes (HAWC, LHAASO) can tighten constraints on the most uncertain parts of the theory calculation related to CR propagation. I will show that neutrinos from the same CR-Sun interactions are a complementary probe of CR propagation, and highlight the prospects for IceCube and future neutrino experiments to detect this exciting new astrophysical signal.

Primary author: Prof. PETER, Annika (The Ohio State University)

Co-authors: Mr NG, Kenny (Weizmann Institute); Prof. BEACOM, John (The Ohio State University); Mr ZHOU, Bei (The Ohio State University); Prof. ROTT, Carsten (Sungkyunkwan University); Dr TANG, Qingwen (The Ohio State University)

Presenter: Prof. PETER, Annika (The Ohio State University)

Session Classification: Early Tuesday Afternoon