NEWS

Michela Negro’s report

Michela Negro - NEWS

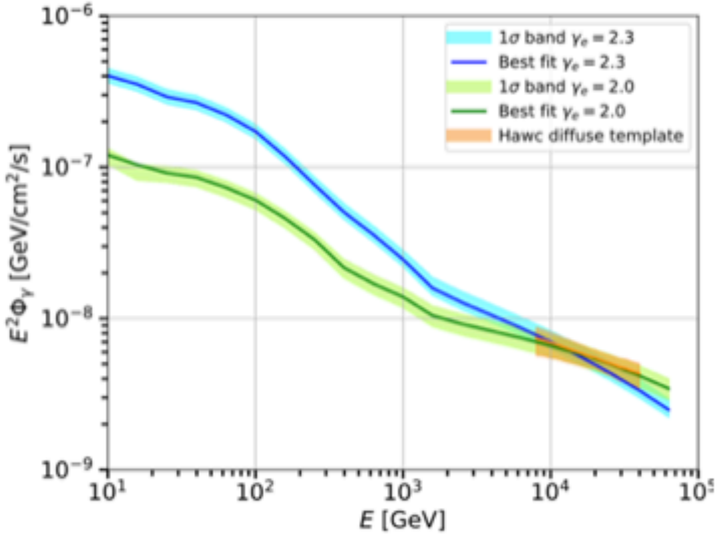
ACTIVITY DETAILS

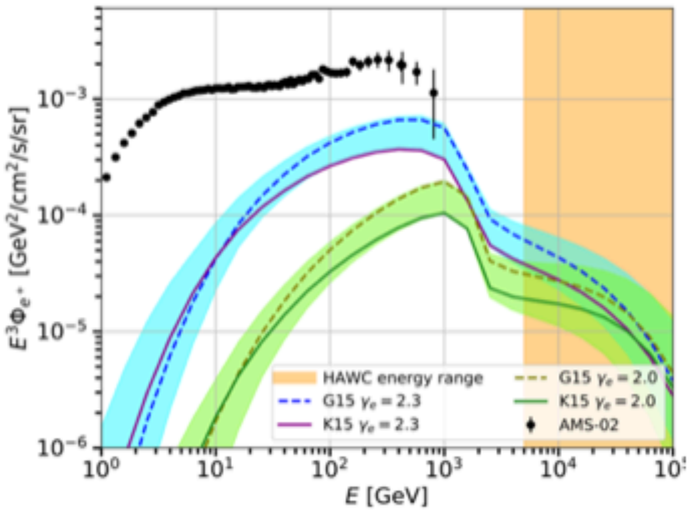
	Experiment	Duration	Place	Activity
First round **20 - 31 May 2019**	Fermi	15 days	NASA - Goddard Space Flight Center (Greenbelt, MD)	Collaboration with GSFC Fermi group - with Mattia Di Mauro and Regina Caputo. Inculdes: Search for extended haloes at GeV energies around pulsar wind nebulae; Set up of the near-future activity related to the study of a cross-correlation signal between the extragalactic gamma-ray sky and the diffuse astrophysical neutrino flux.
Second round **9 - 20 September 2019**	Fermi	15 days	Santa Cruz University (Santa Cruz, CA)	Fermi-LAT Collaboration meeting Includes: coordination of the activity within the “DIFFUSE/CR” science group and the presentation of the status of the studies of interpretation of the autocorrelation measurement.
			NASA - Goddard Space Flight Center (Greenbelt, MD)	Collaborazione con il GSFC Fermi group - with Mattia Di Mauro and Regina Caputo. C Inculdes: Search for extended haloes at GeV energies around pulsar wind nebulae; Set up of the near-future activity related to the study of a cross-correlation signal between the extragalactic gamma-ray sky and the diffuse astrophysical neutrino flux.

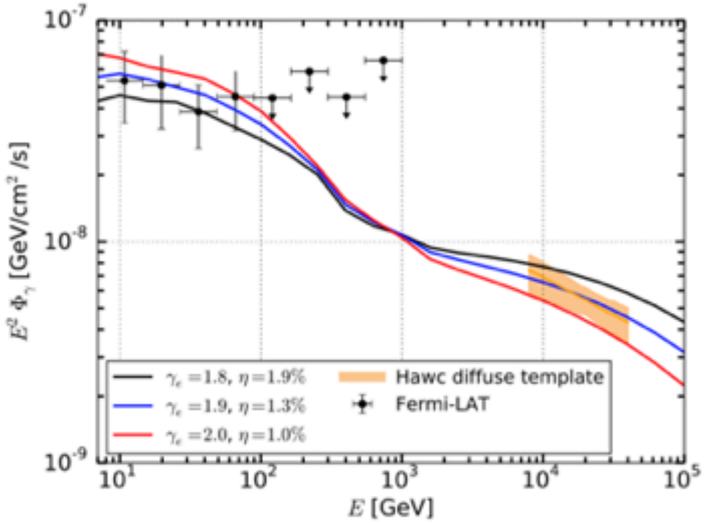
PWN LOW DIFFUSION HALOES CONTRIBUTION TO POSITRON FRACTION

BASED ON THE RECENT STUDY OF GEMINGA NAD MONOGEM: [Di Mauro et al. 2019]

In that work they observe an extended halo (~5deg) by GEMINGA with low diffusion coefficient (~2-3 off with respect to the Galactic value)







1) HESS points at TeV are not enough to determine the spectral index of gamma-rays produced by e+e- in PWN
2) This affects very much the predicted positron spectrum
3) Looking at the Fermi data is crucial

IN THIS PROJECT WE EXPAND THE SEARCH TO A NUMBER OF OTHER PWN SEEN BY HESS.

We've already identified ~10 PWN also seen by fermi as extended sources and associated to PWN

CROSS-CORRELATION BETWEEN EGB/UGRB AND NEUTRINO BACKGROUND

Evidence of 2 populations dominating at different energies to the UGRB

- High-energy population: likely BL-Lacs; Low-energy population: TBD (FSRQs, mAGNs, SRFGs)

Cross-correlation of neutrino background with UGRB Investigate the two energy bands separately

Take *track*-like ICECUBE events and make cross-correlation with EGB: study how does the signal change masking different types of resolved sources (e.g. mask all the FSRQ or all the BL-Lacs, and eventually masking all the resolved sources: if the signal does not change very much playing with resolved sources the neutrino signal comes likely from unresolved sources).

On the other hand: Could we infer if a bunch of neutrino events are astrophysical or not by looking at the variation (increase or no variation) of the cross-correlation signal with EGB when adding them in the analysis?