

Executive Summary

Predictions for gamma-rays from clouds associated with supernova remnant PeVatrons

A. Mitchell, G. Rowell, S. Celli, S. Einecke

What is this contribution about?

This contribution presents a recently published model describing the escape of energetic particles from a supernova remnant, their transport through the interstellar medium and subsequent interaction with interstellar clouds, resulting in a TeV gamma-ray flux.

Why is it interesting?

The most energetic particles accelerated by a supernova will escape the remnant at early times, and supernova remnants are thought to act as PeVatrons during just a short time early in their evolution. Interstellar clouds provide a suitable probe to establish if there was PeVatron activity from supernova remnants in the past.

What have we done?

Using catalogues of known supernova remnants and interstellar clouds, we apply the model to real systems and compare the predicted gamma-ray flux to sky maps from ground-based TeV instruments. In these proceedings, we examine our results in the context of the recent LHAASO sources above 100 TeV.

What is the result?

We provide a list of the 9 most promising clouds; those that are both predicted to be bright in gamma-rays, and have reliably constrained inputs (e.g. constrained distance). We also provide a list of four clouds that may be associated with LHAASO sources.