

Expected gamma-ray emission from Stellar Clusters acting as Galactic PeVatrons

Monday 2 September 2024 09:10 (1 minute)

Galactic cosmic rays may be accelerated up to PeV energies due to collective stellar winds surrounding stellar clusters. Further particle acceleration may occur due to supernova remnants within the wind-blown bubble. We apply a model of particle acceleration accounting for the stellar cluster wind termination shock and supernova remnant shocks to young and massive stellar clusters catalogued in Gaia DR2. The resulting gamma-ray and neutrino emission and size of the wind-blown bubble are predicted, from which we identify the most suitable candidates for future observations of stellar clusters. Detection prospects for future experimental facilities, taking the flux and angular size into account, are evaluated, along with the flux range allowed due to model assumptions and uncertainties.

Primary author: MITCHELL, Alison (Erlangen Centre for Astroparticle Physics, Friedrich-Alexander-Universität Erlangen-Nürnberg)

Co-authors: MORLINO, Giovanni (Istituto Nazionale di Astrofisica (INAF)); CELLI, Silvia (Sapienza University of Rome & INFN); Dr MENCHIARI, Stefano (INAF - Osservatorio Astrofisico di Arcetri)

Presenter: MITCHELL, Alison (Erlangen Centre for Astroparticle Physics, Friedrich-Alexander-Universität Erlangen-Nürnberg)

Session Classification: Poster hang