

Star-forming regions as potential contributors to Galactic cosmic rays: the case of NGC 3603

Executive summary

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An unassociated Fermi-LAT source 4FGL J1115.1–6118 is positionally coincident with a star forming region NGC 3603

Main results [based on morphological & spectral studies]

Unlike Cygnus cocoon and Westerlund 1, gamma-ray emission from 4FGL J1115.1–6118 appears to be pointlike that we found in detailed morphological analysis.

Observed SED can be explained with both leptonic and hadronic scenario. Not possible to disentangle between them for the present observed SED.

Questions: Are 4FGL J1115.1–6118 and NGC 3603 associated? If so, is it energetically viable solution?

No association with known classes of sources are found, So we speculate observed gamma-ray emission is associated with NGC 3603.

Total gamma-ray luminosity is 0.2% of total mechanical wind energy. Hence energetically viable.