

## Z216a Search for the GeV Counterpart of PeVatron LHAASO J1912+1014u using Fermi-LAT and FUGIN CO Data

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LHAASO reported 43 ultra-high-energy sources that are either proton or electron PeVatrons (Cao+24), and multi-wavelength data are crucial for determining particle species and the CR energy density of the source. In this project, we study the LHAASO J1912+1014u (and HESS J1912+101) region using Fermi-LAT GeV data and high-resolution FUGIN CO data to investigate the proton PeVatron scenario. We analyzed 15 years of Fermi-LAT data in 400 MeV to 400 GeV. We improved the standard Fermi-LAT diffuse model by adding a template to reduce large residuals around the source in the 1–10 GeV energy range. We found a significant signal in excess of the diffuse model that may represent the  $\geq 10$  GeV emission of the LHAASO/H.E.S.S. source. We also found that  $^{12}\text{CO}$  maps with velocities of about 60 km/s (Su+17) and 25 km/s (Sano+18, Sano+ in preparation) represent the excess emission better than a simple Gaussian model, indicating that proton acceleration is a feasible scenario.  $\gamma$ -ray photon index is  $\sim 2.2$ , indicating that spectral indices are  $\sim 3$  or  $\sim 2.2$  for the leptonic scenario (inverse Compton dominated case) or hadronic scenario, respectively. The measured flux above 400 MeV is  $\sim 60 \times 10^{-12} \text{ erg s}^{-1} \text{ cm}^{-2}$ , requiring a total proton energy of  $(1-5) \times 10^{49} \text{ erg}$  for the hadronic scenario. We also conducted a detailed search for extended X-ray emission using Chandra data. In this contribution, we present the details of the analysis and its implications for the object.