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An Enigmatic PeVatron in an Area around HII Region G35.6-0.5

Identifying hadronic PeVatrons among ultra-high-energy (UHE) gamma-ray sources is challenging but crucial for understanding the origin of cosmic rays. The UHE source 1LHAASO J1857+0203u is suggested to be associated with HESS J1858+020, which may originate from PeVatron candidate supernova remnant (SNR) G35.6-0.4 or HII region G35.6-0.5. We present a detailed study of TeV gamma-ray emission in this region using LHAASO WCDA and KM2A data. Furthermore, using archival CO and HI data, we identify several molecular and atomic clouds that may be associated with the gamma-ray emission. We discuss three possible origins of the observed GeV-TeV gamma-ray emission: SNR G35.6-0.4, HII region G35.6-0.5, and a yet undetected pulsar wind nebula.

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