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Discovry of TeV Gamma-Ray Emission from the Cygnus Region of the Galaxy with Milagro AOUS ABDO, MSU, MILAGRO COLLABORATION — The diffuse gamma radiation arising from the interaction of cosmic ray particles with matter and radiation in the Galaxy is one of the few probes available to study the origin of the cosmic rays. Milagro is a water Cherenkov detector that continuously views the entire overhead sky. The large field-of-view combined with the long observation time makes Milagro the most sensitive instrument available for the study of large, low surface brightness sources such as the diffuse gamma radiation arising from interactions of cosmic radiation with interstellar matter. Here we present a gamma-ray image of the Cygnus Region at energies near 12 TeV using a new background rejection technique. We have discovered both an extended source and a large area of diffuse gamma-ray emission. The new extended source, MGRO 2019+37, has an extent of 0.33±0.14 degrees and a flux given by $E^2dN/dE = (3.49 \pm 0.47_{stat} \pm 1.05_{sys}) \times 10^{-12} TeV cm^{-2} s^{-1}$ at the median detected energy of 12 TeV assuming a differential source spectrum of $E^{-2.6}$. The flux form the diffuse emission from the Cygnus Region at 12 TeV is $E^2dN/dE = (4.18 \pm 0.52_{stat} \pm 1.26_{sys}) \times 10^{-12} TeV cm^{-2} s^{-1} sr^{-1}$ assuming a differential source spectrum of $E^{-2.6}$.

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