



CANGAROO-III observation of TeV gamma rays from the unidentified gamma-ray source HESS J1614-518

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We report the detection, with the CANGAROO-III imaging atmospheric Cherenkov telescope array, of a very high energy gamma-ray signal from the unidentified gamma-ray source HESS J1614-518, which was discovered in the H.E.S.S. Galactic plane survey. Diffuse gamma-ray emission was detected above 760 GeV at the 8.9 sigma level during an effective exposure of 54 hr from 2008 May to August. The spectrum can be represented by a power-law: $8.2^{+2.2}_{\text{stat}} + 2.5_{\text{sys}} \times 10^{-12} \times (E/1\text{TeV})^{-\Gamma} \text{cm}^{-2} \text{s}^{-1} \text{TeV}^{-1}$ with a photon index Γ of $2.4^{+0.3}_{\text{stat}} + 0.2_{\text{sys}}$, which is compatible with that of the H.E.S.S. observations. By combining our result with multi-wavelength data, we discuss the possible counterparts for HESS J1614-518 and consider radiation mechanisms based on hadronic and leptonic processes for a supernova remnant, stellar winds from massive stars, and a pulsar wind nebula. Although a leptonic origin from a pulsar wind nebula driven by an unknown pulsar remains possible, hadronic-origin emission from an unknown supernova remnant is preferred.

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