

Discovery of 100 TeV gamma-rays from HESS J1702-420: a new PeVatron candidate

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The identification of active PeVatrons, hadronic particle accelerators reaching the knee of the cosmic-ray spectrum (at the energy of few PeV), is crucial to understand the origin of cosmic rays in the Galaxy. In this context, we report on new H.E.S.S. observations of the PeVatron candidate HESS J1702-420, which reveal the presence of gamma-rays up to 100 TeV. This is the first time in the history of H.E.S.S. that photons with such high energy are clearly detected. Remarkably, the new deep observations allowed the discovery of a new gamma-ray source component, called HESS J1702-420A, that was previously hidden under the bulk emission traditionally associated with HESSJ1702-420. This new object has a power-law spectral slope < 2 and a gamma-ray spectrum that, extending with no sign of curvature up to 100 TeV, makes it an excellent candidate site for the presence of PeV-energy cosmic rays. This discovery brings new information to the ongoing debate on the nature of the unidentified source HESSJ1702-420, one of the most compelling PeVatron candidates in the gamma-ray sky, and on the origin of Galactic cosmic rays.

Keywords

gamma-ray; PeVatron; H.E.S.S.; HESS; gammapy; multi-wavelength

Collaboration

H.E.S.S.

other Collaboration

Subcategory

Experimental Results

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