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Detection of the young massive star cluster R136 with H.E.S.S.

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Although supernova remnants are thought to be responsible for the bulk of the flux of cosmic rays in our Galaxy, their ability to produce the highest-energy Galactic cosmic rays is challenged by observations. Measurements of TeV gamma rays from several supernova remnants suggest cut-offs in the underlying particle spectra significantly below PeV energies. On theoretical grounds, young massive star clusters appear to possible avenues to achieving higher energies. An observational confirmation of this hypothesis is still lacking, however, and only few star clusters have been identified as cosmic-ray sources through associating them with sources of high-energy gamma rays.

In this contribution we report on the detection of very-high-energy gamma-ray emission with H.E.S.S. from the young massive star cluster R136 in the Large Magellanic Cloud. This cluster is more than twice as luminous as Westerlund 1, the most massive known young star cluster in the Milky Way. We interpret our results in the framework of the theoretical models that propose young massive star clusters as major cosmic-ray factories.

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