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The very high energy gamma-ray diffuse emission in the Galactic Center region as seen by H.E.S.S

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The Very High Energy (VHE) emission from the Galactic Center Ridge was revealed by H.E.S.S. in 2006, after subtraction of the two bright point sources HESS J1745-290 possibly associated with Sgr A*, and HESS J1747-281 associated with the composite supernova remnant G0.9+0.1. The hard spectrum of the Ridge emission and its spatial correlation with the local gas density suggest that the emission is due to collisions of multi-TeV cosmic rays with the dense clouds of interstellar gas present in this region. The much larger H.E.S.S. dataset (250 hrs) that is now available from this region and the improved analysis method dedicated to the detection of faint emission allow us to reconsider the characterization of this gamma-ray emission through a detailed morphology study and the extraction of the total energy spectrum with much better accuracy. To test the various contributions to the total gamma-ray emission, we use a 2D maximum likelihood approach that allows to constrain a phenomenological model of the signal. We discuss the nature of the various components, their implication on the cosmic-ray distribution in the central region of our Galaxy, and their possible connection with HESS J1747-281. Finally, we reveal an additional source in this region and discuss its potential nature.

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