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A joint Fermi-LAT and H.E.S.S. analysis of the Crab nebula

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The Crab pulsar wind nebula is one of the best-studied objects in the gamma-ray sky. Recently, its angular extension in the gamma-ray domain could be resolved in separate analyses of Fermi-LAT and H.E.S.S. data, which provides crucial information about the spatial distribution of relativistic particles in the nebula. In this contribution we provide, for the first time, a measurement of the energy spectrum and extension of the nebula over five decades of energy with a joint Fermi-LAT and H.E.S.S. analysis. We obtain clear evidence for a shrinking of the nebula with energy, as is expected from theoretical models. However, taking into account the multi-wavelength data, we find that none of the tested theoretical models succeed in simultaneously describing both the energy spectrum and angular extension over the full energy range.

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