

# Observation of Extended Very High Energy Emission from the Supernova Remnant IC 443 with VERITAS

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We present evidence that the very high energy (VHE,  $E > 100$  GeV) gamma-ray emission coincident with the supernova remnant IC 443 is extended. IC 443 contains one of the best studied sites of supernova remnant/molecular cloud interaction and the pulsar wind nebula CXOU J061705.3+222127, both of which are important targets for VHE observations. VERITAS observed IC 443 for 37.9 hr during 2007 and detected emission above 300 GeV with an excess of 247 events, resulting in a significance of 8.3 standard deviations ( $\sigma$ ) before trials and 7.5 $\sigma$  after trials in a point-source search. The emission is centered at 6h16m51s + 22°30'11" (J2000)  $\pm 0.03$ stat  $\pm 0.08$ sys, with an intrinsic extension of  $0.16 \pm 0.03$ stat  $\pm 0.04$ sys. The VHE spectrum is well fit by a power law ( $dN/dE = N_0 \times (E/\text{TeV})^{-\Gamma}$ ) with a photon index of  $2.99 \pm 0.38$ stat  $\pm 0.3$ sys and an integral flux above 300 GeV of  $(4.63 \pm 0.90$ stat  $\pm 0.93$ sys)  $\times 10^{-12}$  cm<sup>-2</sup> s<sup>-1</sup>. These results are discussed in the context of existing models for gamma-ray production in IC 443.