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## A Deep Observation of Gamma-ray Emission from Cassiopeia A using VERITAS

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Supernova remnants (SNRs) have long been considered the leading candidates for the accelerators of cosmic rays within the Galaxy through the process of diffusive shock acceleration. The connection between SNRs and cosmic rays is supported by the detection of high energy (HE; 100 MeV to 100 GeV) and very high energy (VHE; 100 GeV to 100 TeV) gamma rays from young and middle-aged SNRs. However, the interpretation of the gamma-ray observations is not unique. This is because gamma rays can be produced both by electrons through non-thermal Bremsstrahlung and inverse Compton scattering, and by protons through proton-proton collisions and subsequent neutral-pion decay. To disentangle and quantify the contributions of electrons and protons to the gamma-ray flux, it is necessary to measure precisely the spectra and morphology of SNRs over a broad range of gamma-ray energies. Cassiopeia A (Cas A) is one such young SNR (~350 years) which is bright in radio and X-rays. It has been detected as a bright point source in HE gamma rays by Fermi-LAT and in VHE gamma rays by HEGRA, MAGIC and VERITAS. Cas A has been observed with VERITAS for more than 60 hours, tripling the published exposure. The observations span 2007-2013, and half of the data were taken at large zenith angles to boost the effective area above few TeV. We will present the detailed spectral and morphological results from the complete dataset.

### Oral or Poster Presentation

Oral

**Primary author:** Mr GHIOTTO, Augusto (Columbia University, VERITAS Collaboration)

**Presenter:** Mr GHIOTTO, Augusto (Columbia University, VERITAS Collaboration)

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