

Constraining the Extragalactic Background Light using H.E.S.S Observations of M87

The diffuse Extragalactic Background Light (EBL) consists of the total emitted light from all stars throughout the history of the Universe. Through pair-production with EBL photons, Very High Energy (VHE) gamma-rays are attenuated as they travel through the Universe, leaving a unique mark on the detected spectra of VHE gamma-ray sources. Due to the relatively small EBL optical depth, most studies attempting to measure the EBL through this phenomena have used higher redshift sources. M87 is a nearby ($z \sim 0.0042$) radio galaxy which has been extensively studied at numerous wavelengths, and is a known source of VHE gamma-rays. In this study we attempt to measure the local EBL through its attenuation of the TeV gamma-ray spectrum of M87 during its high-states using data obtained with the High Energy Stereoscopic System (H.E.S.S). We find that an EBL-attenuated spectrum is preferred at the $\sim 2.5 \sigma$ level to a pure power-law.

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