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Selection of AGN to study the extragalactic background light with HAWC

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The extragalactic background light (EBL) is all the electromagnetic energy released by resolved and unresolved extragalactic sources since the recombination era. Its intensity and spectral shape provide information about the evolution of galaxies throughout cosmic history. Since direct observations of the EBL are very difficult to perform, the study of the interaction between the low energy EBL photons and high energy photons from distant sources becomes relevant to constrain the EBL intensity. The main goal of this study is to investigate the opacity of the EBL to gamma rays by observing a sample of active galaxies with the High Altitude Water Cherenkov (HAWC) Gamma-Ray Observatory. Current gamma-ray observations up to 20 TeV performed by Imaging Atmospheric Cherenkov Telescopes (IACTs) have constrained the EBL intensity in the $0.1 - 50$ μm region. HAWC which monitors the gamma-ray sky in the 100 GeV to 100 TeV energy range, will be able to detect at least 12 active galaxies at redshifts below 0.3 and thus constrain the EBL in the poorly-measured $1 - 100$ μm region.

Collaboration

HAWC

Registration number following "ICRC2015-I/"

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