

Limits on the Diffuse Gamma-Ray Background with HAWC

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Executive summary

The Diffuse Gamma-Ray Background (DGRB) is expected to be produced by unresolved extragalactic objects. At TeV energies, limits on the DGRB could have significant multi-messenger implications, such as constraining the origin of astrophysical neutrinos detected by IceCube.

We apply strict cuts on 535 days of data from the High Altitude Water Cherenkov (HAWC) observatory to better isolate gamma-ray air showers from background hadronic showers. We then perform a maximum likelihood analysis to calculate the 95% confidence level limits on the DGRB emissions with respect to the Crab Nebula and compare our results to other experiments.

Finally, we inject the isotropic spectral models from IceCube and H.E.S.S. to evaluate the consistency between our data and said models. A better understanding of the cosmic-ray contamination is underway and would help break the degeneracy.

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