

Bispectrum analysis of the unresolved gamma-ray background

Executive summary

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This contribution is based on the work done for the attainment of a master's degree during this academic year (2020-2021). The aim has been to study what information about the unresolved gamma-ray background [UGRB] can be obtained through the measurement of the angular bispectrum, which is the spherical harmonic transform of the three-point correlation function $B_{l_1 l_2 l_3}^{m_1 m_2 m_3} = \langle a_{l_1 m_1} a_{l_2 m_2} a_{l_3 m_3} \rangle$. The detection of a non-trivial bispectrum amplitude can help constrain the properties of astrophysical sources contributing to the UGRB and may help resolve the open question about the origin and nature of the UGRB. The pipeline developed in the context of the angular power spectrum analysis of the UGRB has been extended to the angular bispectrum and was applied to 8 years of *Fermi*-LAT data in the energy range between 700 MeV and 1 TeV. No significant detection of a contribution due to unresolved point sources has been found due to difficulties in distinguishing the contribution due to photon noise from a signal contribution.

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