



Universidad del País Vasco
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Seminarios de Física Teórica Fisika Teorikoa: Hitzaldiak

Dipolar Modulation in the CMB

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Abstract The connection between the dipolar modulation asymmetry and the quadrupole-octopole alignment in the CMB is studied in this work. First, a generalization of the dipolar modulation model is proposed by considering that the amplitude may depend on the scale. As derived from a Bayesian inference analysis, this model fits the CMB data better than the scale-independent one. As an extension of the standard model, the scale-dependent dipolar modulation shows comparable evidence to the standard isotropic model in the large scales ($l_{\text{max}} \leq 64$). The posterior distribution of the parameters of the scale-dependent model suggests that the amplitude of the dipolar modulation is large at the lowest multipoles. This large asymmetry induces a detectable correlation between the quadrupole and the octopole. The significance of the quadrupole-octopole alignment is analyzed under the assumption that the Universe has a scale-dependent dipolar modulation. The three alignment estimators considered in this paper show an increment of 80% in the p-value. Therefore, it is found that the alignment between the quadrupole and octopole is more likely assuming a scale-dependent dipolar modulation than in the standard model. Within this dipolar modulation scenario, only one of the alignment estimators is still below the 1% probability level.

Prof. A. Chamorro Seminar Room, Dept. of Theoretical Physics, Corridor 4.-2.

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Time:11:40 am