Non-Gaussianity and the Cosmic Microwave Background Anisotropies

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We review in a pedagogical way the present status of the impact of non-Gaussianity (NG) on the Cosmic Microwave Background (CMB) anisotropies. We first show how to set the initial conditions at second-order for the (gauge invariant) CMB anisotropies when some primordial NG is present. However, there are many sources of NG in CMB anisotropies, beyond the primord one, which can contaminate the primordial signal. We mainly focus on the NG generated from the post-inflationary evolution of the CMB anisotropies at second-order in perturbation theory a large and small angular scales, such as the ones generated at the recombination epoch. We show how to derive the equations to study the second-order CMB anisotropies and provide analytical computations to evaluate their contamination to primordial NG (complemented with numerical examples). We also offer a brief summary of other secondary effects. This review requires basic knowledge of the theory of cosmological perturbations at the linear level.

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