Non-Gaussian Signatures in the Lens Deformations of the CMB Sky. A New Ray-Tracing Procedure
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abstract We work in the framework of an inflationary cold dark matter universe with cosmological constant, in which the cosmological inhomogeneities are considered as gravitational lenses for the CMB photons. This lensing deforms the angular distribution of the CMB maps in such a way that the induced deformations are not Gaussian. Our main goal is the estimation of the deviations with respect to Gaussianity appeared in the distribution of deformations. In the new approach used in this paper, matter is evolved with a particle-mesh N-body code and, then, an useful ray-tracing technique designed to calculate the correlations of the lens deformations induced by nonlinear structures is applied. Our approach is described in detail and tested. Various correlations are estimated at an appropriate angular scale. The resulting values point out both deviations with respect to Gaussian statistics and a low level of correlation in the lens deformations.