# Consistency relation for the Lorentz invariant single-field inflation

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In this paper we compute the sizes of equilateral and orthogonal shape bispectrum for the general Lorentz invariant single-field inflation. The stability of field theory implies a non-negative square of sound speed which leads to a consistency relation between the sizes of orthogonal and equilateral shape bispectrum, namely $f_{NL}^{orth.}\lesssim -0.054 f_{NL}^{equil.}$. In particular, for the single-field Dirac-Born-Infeld (DBI) inflation, the consistency relation becomes $f_{NL}^{orth.}\simeq 0.070 f_{NL}^{equil.}\lesssim 0$. These consistency relations are also va in the mixed scenario where the quantum fluctuations of some other light scalar fields contribute to a part of total curvature perturbation on the super-horizon scale and may generate a local form bispectrum. A distinguishing prediction of the mixed scenario is $\tau_{NL}^{loc.}>({6\over 5}f_{NL}^{loc.})^2$. Comparing these consistency relations to WMAP 7yr data, there is still a bi room for the Lorentz invariant inflation, but DBI inflation has been disfavored at more than 68% CL.

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