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Peaks sphericity of non-Gaussian random fields

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We formulate the statistics of peaks of non-Gaussian random fields and implement it to study the sphericity of peaks. For non-Gaussianity of the local type, we present a general formalism valid regardless of how large the deviation from Gaussian statistics is. For general types of non-Gaussianity, we provide a framework that applies to any system with a given power spectrum and the corresponding bispectrum in the regime in which contributions from higher-order correlators can be neglected. We present an explicit expression for the most probable values of the sphericity parameters, including the effect of non-Gaussianity on the profile. We show that the effects of small perturbative non-Gaussianity on the sphericity parameters are negligible, as they are even smaller than the subleading Gaussian corrections. In contrast, we find that large non-Gaussianity can significantly distort the peak configurations, making them much less spherical.

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