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Celestial Non-Gaussianities in Collider Energy Flux

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Energy Correlators (EEC) have recently received great interest both theoretically and experimentally. In particular, the study of EECs in jet substructure has gained deeper understanding with the advent of the light-ray operator product expansion. In this talk, based on this progress, we propose a ratio observable named "celestial non-gaussianity", which roughly is the ratio between three-point energy correlator and a product of two-point correlators. The underlying motivation for such a construction is to probe how the three-point function deviates from the factorization into a product of two-point functions in the squeezed limit. One salient feature of the "celestial non-gaussianity"is its robustness to hadronization effects. We compare our perturbative prediction with CMS Open Data finding good agreement. We anticipate the celestial non-gaussianity and its possible generalizations will be helpful for future precision measurement of effects like spin correlations and the development of parton showers.

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