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Energy Correlators taking Charge

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Recently, spurred by significant theoretical advances, an exciting program has been launched to reframe jet substructure in terms of multipoint correlation functions of energy flow operators. These energy correlators successfully image the intrinsic and emergent scales of QCD as a function of scale with many interesting phenomenological applications.

In this talk, we present an exciting vision of the future, where we go beyond the simple energy flow paradigm and expand the landscape of asymptotic observables / detectors to gain insight into how different quantum numbers flow. Using charge flow as an example, we demonstrate how charge energy correlators nontrivially modify the scaling behaviors in the perturbative scattering region, thereby illustrating nontrivial changes in the hadronization transition rate. Furthermore, we will discuss the insight that can be gained from this approach and initiate the exciting program to generalize to even wider class of asymptotic observables.

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