

Pure Quark and Gluon Observables in Collinear Drop

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A key application of jet substructure techniques is to disentangle quark- and gluon-initiated jets. One data-driven method to realize the disentangling is jet topics which can give the individual quark and gluon contributions to an observable, but faces challenges associated to finding regions of phase space that can be associated with pure quark and gluon samples. In this talk, I construct a set of pure quark and gluon observables with the collinear drop grooming technique. For example, a gluon observable is constructed so as to give a vanishing distribution for any sample that has only quark jets, and a non-vanishing result for any process which can produce gluon jets. The construction utilizes factorization formulas constructed using Soft-Collinear Effective Theory (SCET) which crucially include both perturbative and non-perturbative effects. Results of these pure quark and gluon observables will be shown and discussed.

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