Contribution ID: **308** Type: **Oral presentation**

First measurement of the energy-energy correlator in the back-to-back limit using archived ALEPH e+e- data at 91.2 GeV

Tuesday, 24 September 2024 11:50 (20 minutes)

Measurements of hard probes in e^+e^- collision data are essential components of parallel studies of hard probes in proton-proton and heavy-ion collisions as e^+e^- collisions offer a true reference for such systems free from any hadronic initial state effects. Recently, one class of hard-probe observables that has seen a resurgence of interest for studying vacuum QCD are the projected N-point energy correlation function (ENCs) of particles within jets. This is primarily due to a clear separation of scales these observables provide, which is useful for studying both perturbative and non-perturbative QCD in the collinear limit. An analogous class of observables can be used to study QCD in the back-to-back (Sudakov) limit, but in hadronic collisions, such studies have additional experimental difficulties. In this talk, we will discuss recent ENC measurements from Archived ALEPH e^+e^- data taken at LEP at $\sqrt{s} = 91.2$ GeV spanning, for the first time, both the collinear to the back-to-back limit of QCD as well as the transition between these two regimes. These results can be used to extract a value of the strong coupling constant (α_s) in addition to performing precision tests of pQCD with generators. The ENCs prove to be highly discriminative observable when compared to models, with the different generators showing a large spread in their predictions.

Category

Experiment

Collaboration

ALEPH

Primary authors: BATY, Austin Alan (University of Illinois Chicago); MC GINN, Christopher (Massachusetts Inst. of Technology (US)); INNOCENTI, Gian Michele (Massachusetts Inst. of Technology (US)); BOSSI, Hannah (Massachusetts Inst. of Technology (US)); LEE, Yen-Jie (Massachusetts Inst. of Technology (US)); Ms CHEN, Yi (Vanderbilt University (US)); CHEN, Yu-Chen (Janice) (Massachusetts Institute of Technology)

Presenter: CHEN, Yu-Chen (Janice) (Massachusetts Institute of Technology)

Session Classification: Parallel Session 13

Track Classification: 1. Jets modification and medium response