



Contribution ID: 496

Type: Oral presentation

Two-particle correlation in e^+e^- collisions at 91-209 GeV with archived ALEPH data

Wednesday, April 6, 2022 3:00 PM (20 minutes)

The first measurement of *anti* - k_T jets and two-particle angular correlations of charged particles emitted in high energy e^+e^- annihilation is presented. The archived data at a center-of-mass energy of 91-209 GeV were collected with the ALEPH detector at LEP between 1992 and 2000.

At 91 GeV, no significant long-range correlation was observed in either the lab coordinate analysis or the thrust coordinate analysis, where the latter is sensitive to a medium expanding transverse to the color string between the outgoing $q\bar{q}$ pair from Z boson decays. We also present the first measurement of anti- k_T jet energy spectra and substructures compared to various event generators, NLO, and NLL'+R resummation calculations.

The correlation functions are measured over a broad range of pseudorapidity and full azimuth as a function of charged particle multiplicity for the first time with LEP2 data. This data set provides higher event multiplicity reach up to around 50 and a chance to sample different underlying hard-scattering processes. Studies of the high energy annihilation data will expand our search for collective phenomena in e^+e^- collisions to a new phase space for a potential discovery.

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Session Classification: Parallel Session T05: QGP in small and medium systems

Track Classification: QGP in small and medium systems