

Jet fragmentaton via recombination of parton showers

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We have studied [1] hadron production in jets by applying quark recombination [2,3,4] to jet shower partons. With the jet showers obtained from PYTHIA [5] and augmented by additional non-perturbative effects, we have computed hadron spectra in e^+e^- collisions at $s^{1/2} = 200$ GeV. Including contributions from resonance decays, we find that the resulting transverse momentum spectra for pions, kaons, and protons reproduce reasonably those from the string fragmentation as implemented in PYTHIA as shown in Fig.1. Our study thus indicates that hadron production from jets can be described by the recombination of shower partons inside the jets. In the presence of a quark-gluon plasma (QGP), our approach then provides a promising framework to study the medium modification of fragmentation functions by allowing shower partons to recombine with the thermal partons in the QGP.

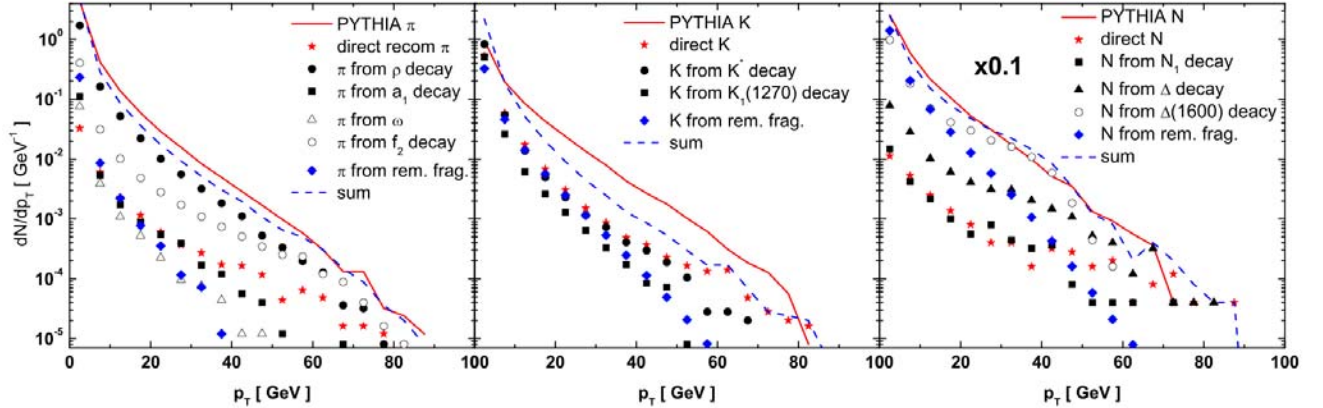


FIG. 1. Transverse momentum spectra of pions (left panel), kaons (middle panel), and nucleons (right panel) from the recombination of jet shower partons (dashed lines) and from the string fragmentation as implemented in PYTHIA (solid lines).

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