

Out of Medium Fragmentation from Long-Lived Jet Showers

Tuesday, 29 May 2012 14:15 (20 minutes)

We study the time structure of vacuum jet evolution via a simple uncertainty principle estimate in the kinematic range explored by current heavy ion collisions at the LHC. We observe that a large fraction of the partonic splittings occur at large times, of the order of several fm. We compare the time distribution of vacuum splittings with the distribution of path lengths traversed by jets in a heavy ion collision. We find that if no medium induced modification of the jet dynamics were present, a very large fraction (larger than 80% for inclusive jets) of the jet splittings would occur outside of the medium. We confront this observation with current available data on jet properties in heavy ion collisions and discuss its implications for the dynamics of jet-medium interactions.

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Session Classification: Parallel IIIB: Jet quenching and energy loss