

Non-extensive Statistical Approach to Fragmentation

The first part of this talk presents a possible statistical physical description of hadron production in electron-positron collisions. The main idea of the model is that hadrons produced inside a jet may be considered as a microcanonical ensemble, with multiplicity fluctuating event by event. The obtained hadron spectrum is in good agreement with measured fragmentation functions [1].

Furthermore, at low energies, the above hadron spectrum coincides with the Tsallis distribution, which gives good fittings to hadron spectra stemming from proton-proton and nucleus-nucleus collisions. In the second part of the talk, I provide mathematical proof for the emergence of the Tsallis distribution in systems with special interactions, and present results of a parton collision cascade simulation based on these interactions [2].

[1] Karoly Urmosy, Gergely Gabor Barnafoldi, Tamas Sandor Biro,
Generalised Tsallis Statistics in Electron-Positron Collisions
arXiv:1101.3023 (Submitted to PLB)

[2] Karoly Urmosy, Tamas S. Biro, Gergely G. Barnaföldi
Pion Production Via Resonance Decay in a Non-extensive Quark-Gluon Medium with Non-additive Energy
Composition Rule
arXiv:1101.3522 (Proceedings of Hot and Cold Baryonic Matter 2010)

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