Is the double hump structure observed in azimuthal correlations in *Au-Au* collisions inexistent in *pp* collisions ?

Alejandro Ayala, Eleazar Cuautle, Isabel Domínguez, Antonio Ortiz and Guy Paić

Abstract for Quark Matter 2009
(29 March 2009 to 04 April 2009)
submitted as theoretical work!

Quark Matter 2009 : March 30th - April 4th, 2009 : Knoxville, Tennessee

Is the double hump structure observed in azimuthal correlations in $Au-Au$ collisions inexistent in pp collisions ?

Alejandro Ayala, Eleazar Cuautle, Isabel Domínguez, Antonio Ortiz and **Guy Paić**

Instituto de Ciencias Nucleares, Universidad Nacional Autónoma de México
México, Distrito Federal, 04510, México

Contact e-mail: *ecuautle@nucleares.unam.mx*

The azimuthal hadron correlations allow the study of parton energy loss in heavy ion collisions. For several years now, considerable attention has been focused on the so called "double hump structure" observed in the away side azimuthal correlations[1] in central $Au-Au$ collisions, in sharp contrast with the results of pp collisions. In the present work we analyze the pp case using a sample of PYTHIA generated minimum bias events and the Event Shape Analysis (ESA)[2]. By these means, we isolate specific event topologies to investigate the possible existence of a double hump in the away side azimuthal correlation. The topological analysis in terms of the transverse thrust variable reveals that indeed, as one would expect from QCD, there is a finite probability for three-prong events where three jets are emitted at 120 degrees from each other. The impact of the present analysis on the extraction of the k_t parameter will be discussed.

References

[1] A. Adare, et al. (PHENIX collaboration), *Phys. Rev.* **C 78**,014901 (2008)
[2] Alejandro Ayala, Eleazar Cuautle, Isabel Domínguez, Antonio Ortiz and Guy Paić. **arXiv:0902.0074[hep-ph]**

Preparing the poster:

Outline

- **Introduction**
- **Azimuthal correlation:**
  - **double hump, experimental results**
  - **energy loss or q hat**
- **Event Shape Analysis:**
  - **Thrust and Sphericity variables**
  - **pp and ion-ion collision**
- **Results**
  - **Double hump in the away side azimuthal correlation.**
  - **Extraction of k_t parameter**
  - **Energy loss discussion ?**
  - **Is there something else?**