Contribution ID: **26** Type: **not specified**

# Triangular flow in hydrodynamics and transport theory

*Tuesday, 31 August 2010 14:00 (1 hour)*

In ultrarelativistic heavy-ion collisions, the Fourier decomposition of the relative azimuthal angle, $\Delta\phi$, distribution of particle pairs yields a large $\cos(3\Delta\phi)$ component, extending out to large rapidity separations $\Delta\eta > 1$. This component captures a significant portion of the ridge and shoulder structures in the $\Delta\phi$ distribution, which have been observed after contributions from elliptic flow are subtracted. An average finite triangularity due to event-by-event fluctuations in the initial matter distribution, followed by collective flow, naturally produces a $\cos(3\Delta\phi)$ correlation. Using ideal and viscous hydrodynamics, and transport theory, we study the physics of triangular ($v_3$) flow in comparison to elliptic ($v_2$), quadrangular ($v_4$) and pentagonal ($v_5$) flow. We make quantitative predictions for $v_3$ at RHIC and LHC as a function of centrality and transverse momentum. Our results for the centrality dependence of $v_3$ show a quantitative agreement with data extracted from previous correlation measurements by the STAR collaboration. This study supports previous results on the importance of triangular flow in the understanding of ridge and shoulder structures. Triangular flow is found to be a sensitive probe of initial geometry fluctuations and viscosity.

**Primary author:** Dr LUZUM, Matthew (CEA Saclay)

**Presenter:** Dr LUZUM, Matthew (CEA Saclay)