The existence of nuclei with non-spherical shapes was first suggested by J.A. Wheeler in 1950.
Au + Au
23 AMeV

Well defined events
$N_{frag} \geq 5 \quad Z_{frag} \geq 10$

Shape analysis

Coplanarity versus sphericity
\[ \Delta^2 = \text{measure of event flatness} \]

\[ d_i = \left| A v_{x_i} + B v_{y_i} + C v_{z_i} + D \right| \]
\[ \sqrt{A^2 + B^2 + C^2} \]

\[ \Delta^2 = \min \sum_{i=1}^{5} d_i^2 (A, B, C, D) \]
Observables distributions:

Selection of flat events:

$\delta < 0.05$

$\Delta^2 < 0.001 \ c^2$

$\Theta_{\text{Flow}} > 20$

$\Theta_{\text{Plane}} < 75$
The efficiency factor

Efficiency factor – ratio of number of events fulfilling the selection conditions to the total number of events with 5 heavy fragments
Summary and outlook

• The bulk properties of the experimental data are shown. The experimental data are compared with ETNA and QMD model predictions.

• Efficiency factor is used as indication of formation of exotic freeze-out configuration.

• Comparison between experimental data and model predictions may indicate the formation of flat/toroidal nuclear system.

• The latest observation need to be verified by more detailed analysis. This analysis is in progress.