

Centrality and event plane checks with elongated PSD geometry

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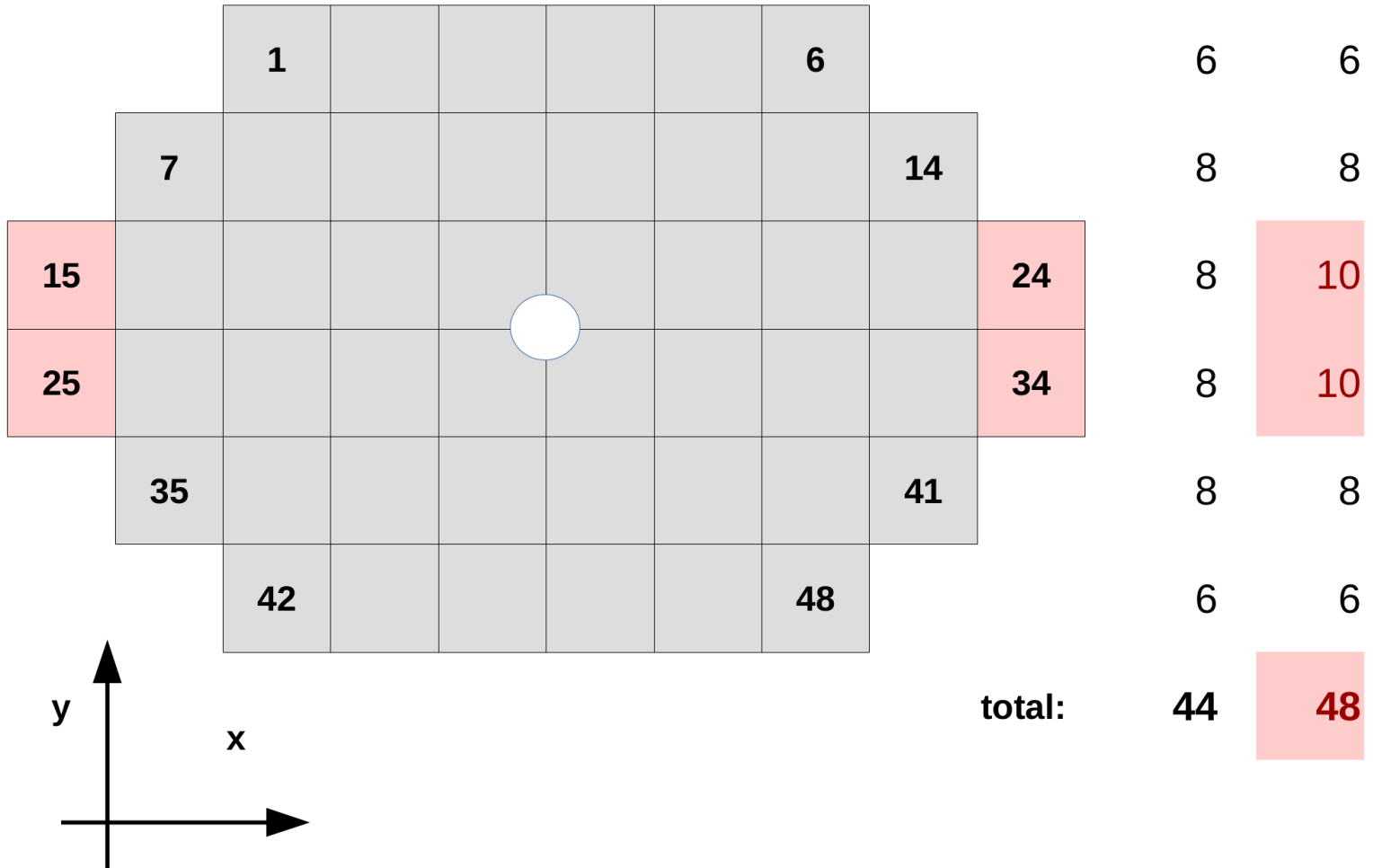
(GSI)

For the CBM Collaboration

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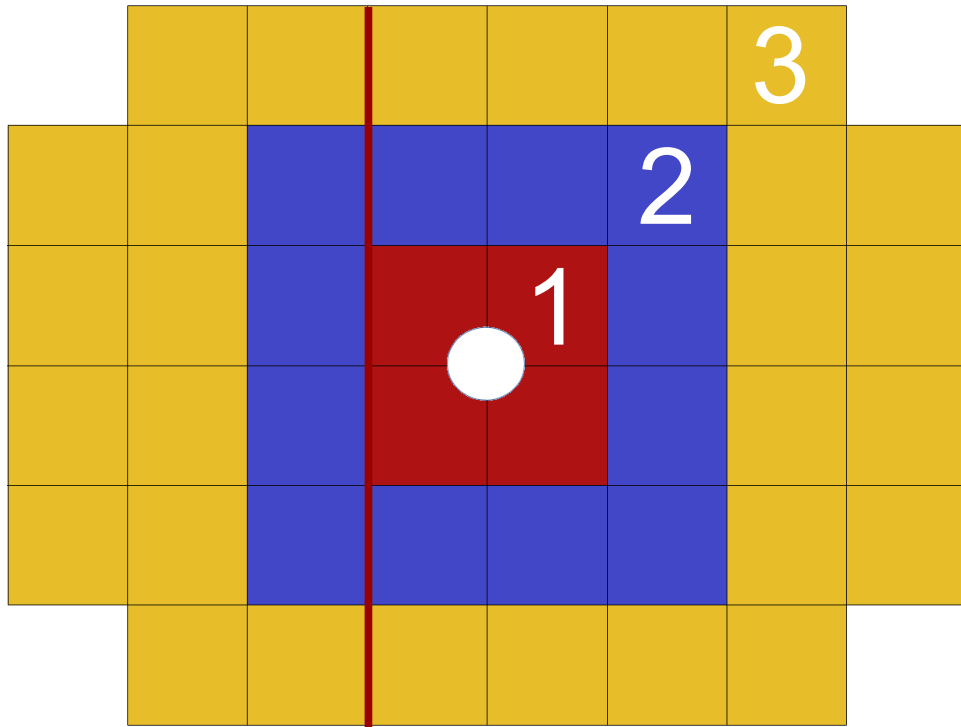
Elongated PSD geometry

Two alternative configurations: 44 and **48** modules



PSD subevent definition

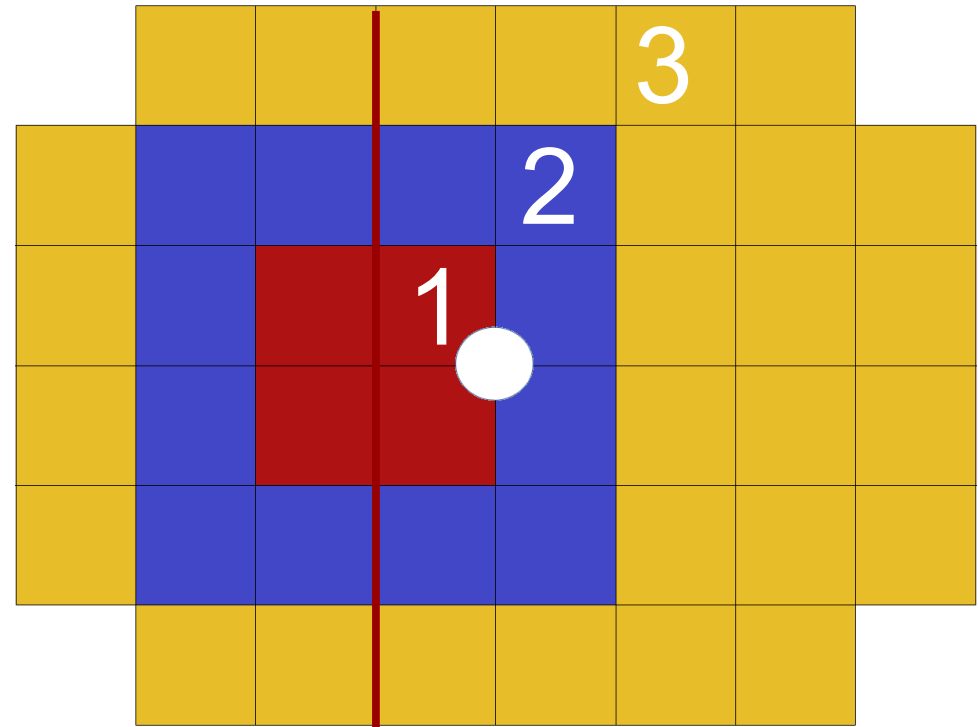
beam-centered
centered around beam spot



$x_{lab}=0$

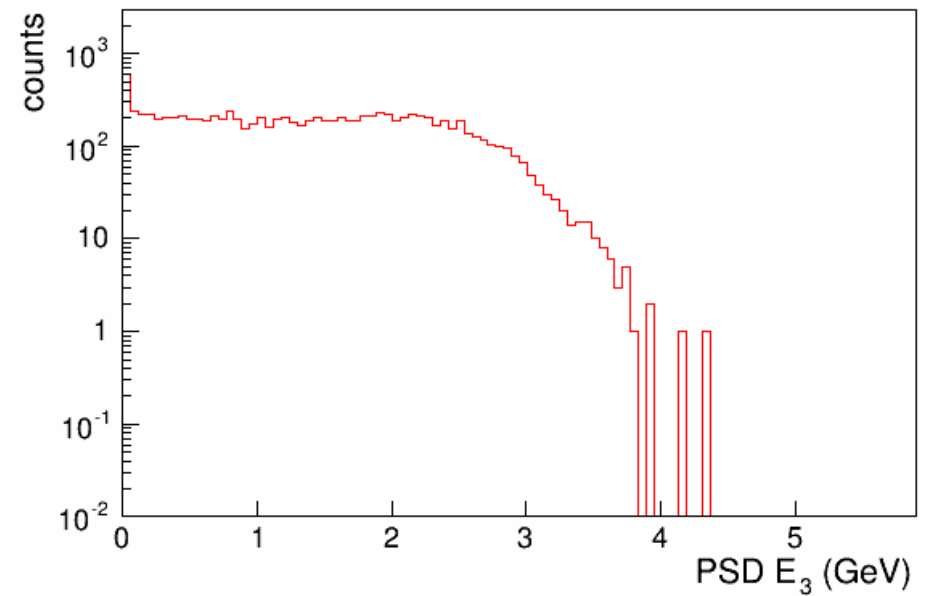
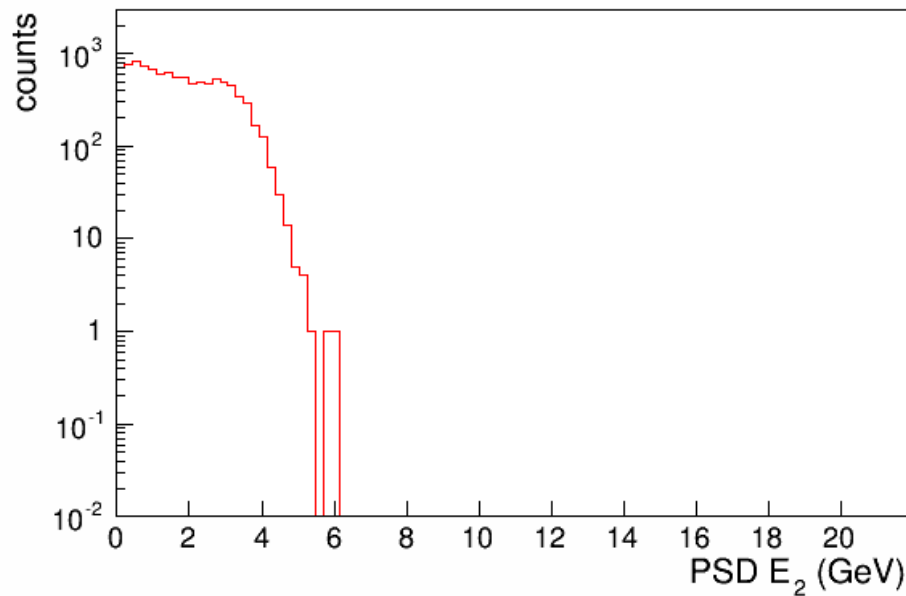
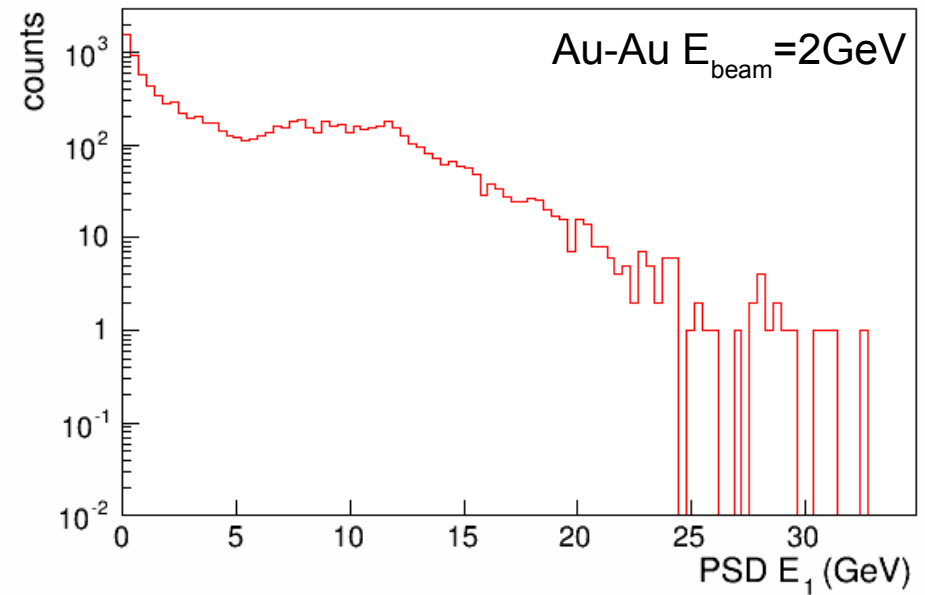
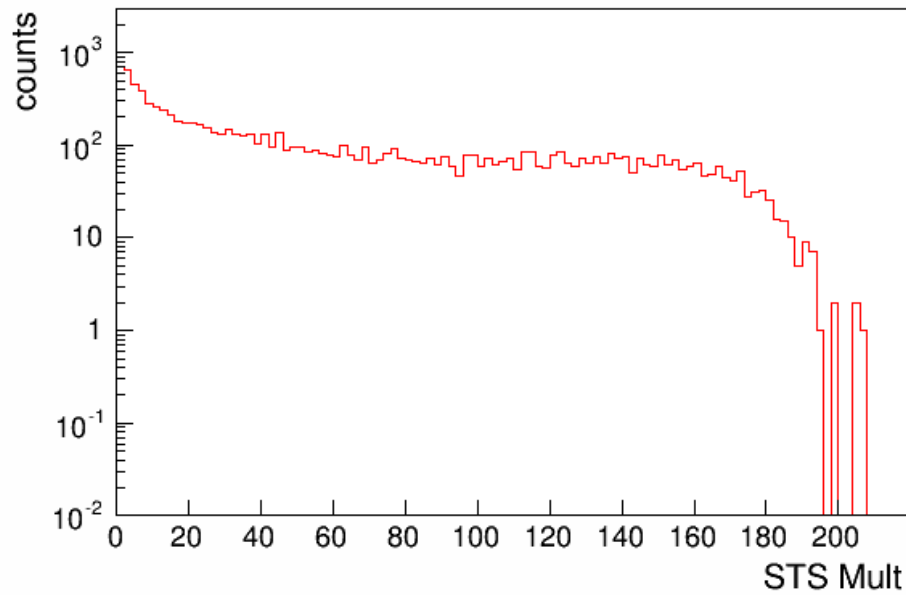
sub1
sub2
sub3

lab-centered
centered around $x_{lab}=y_{lab}=0$ of the target

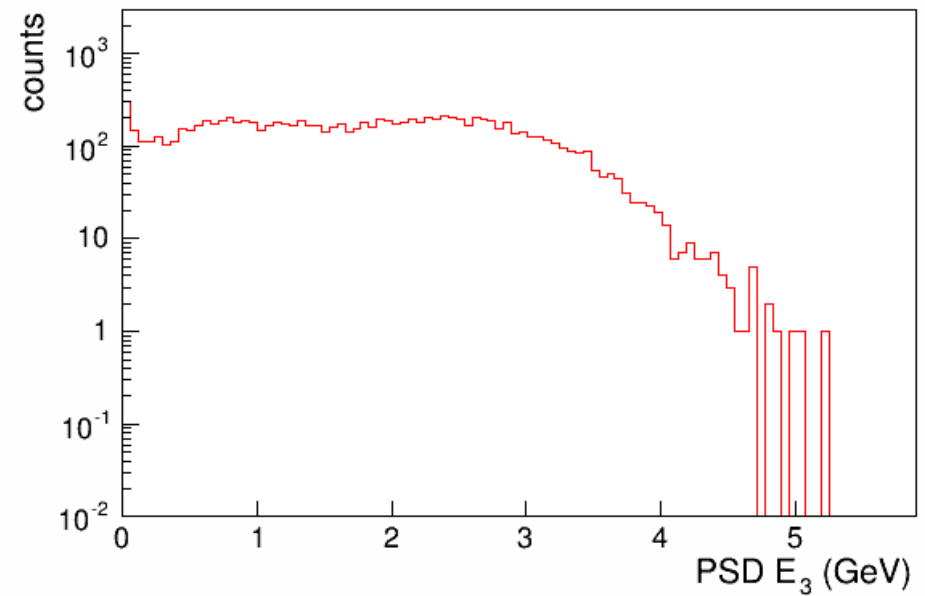
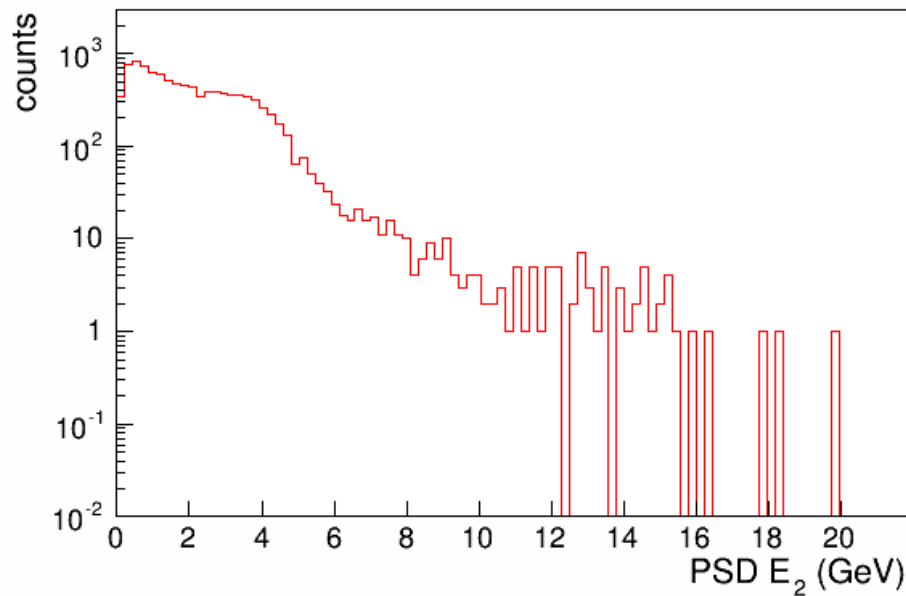
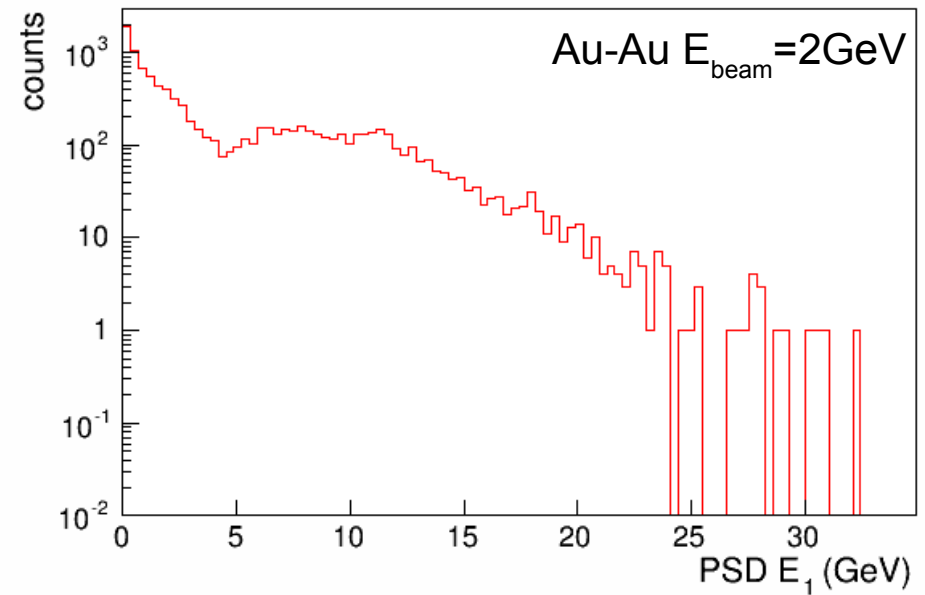
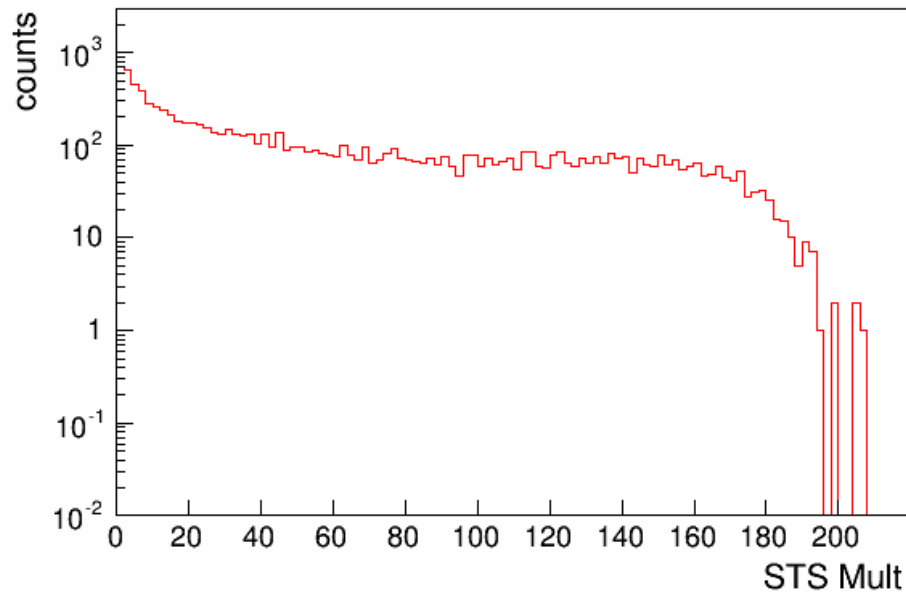


$x_{lab}=0$

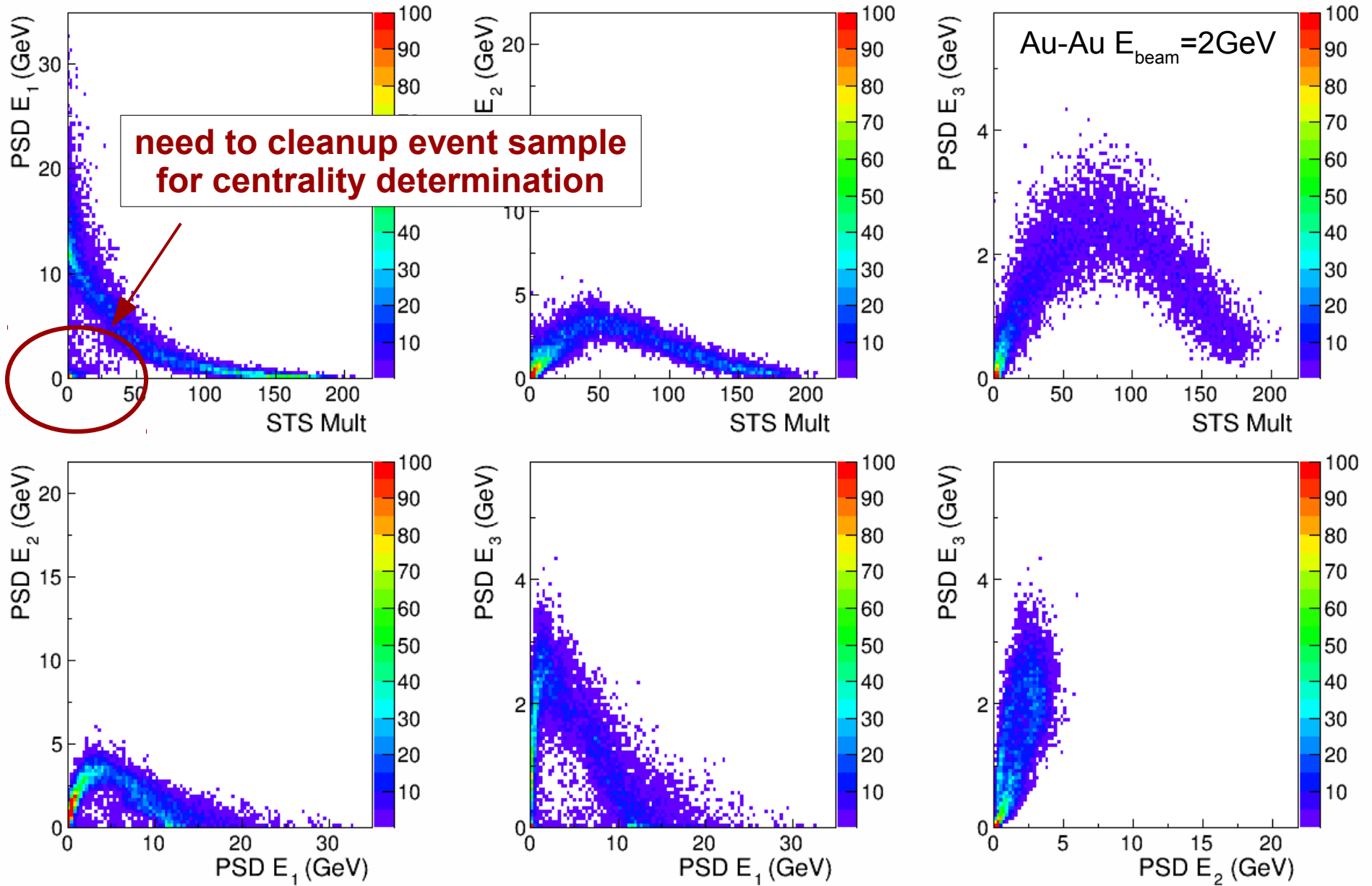
multiplicity distribution: STS vs. “beam-centered” PSD subevents



multiplicity distribution: STS vs. “lab-centered” PSD subevents

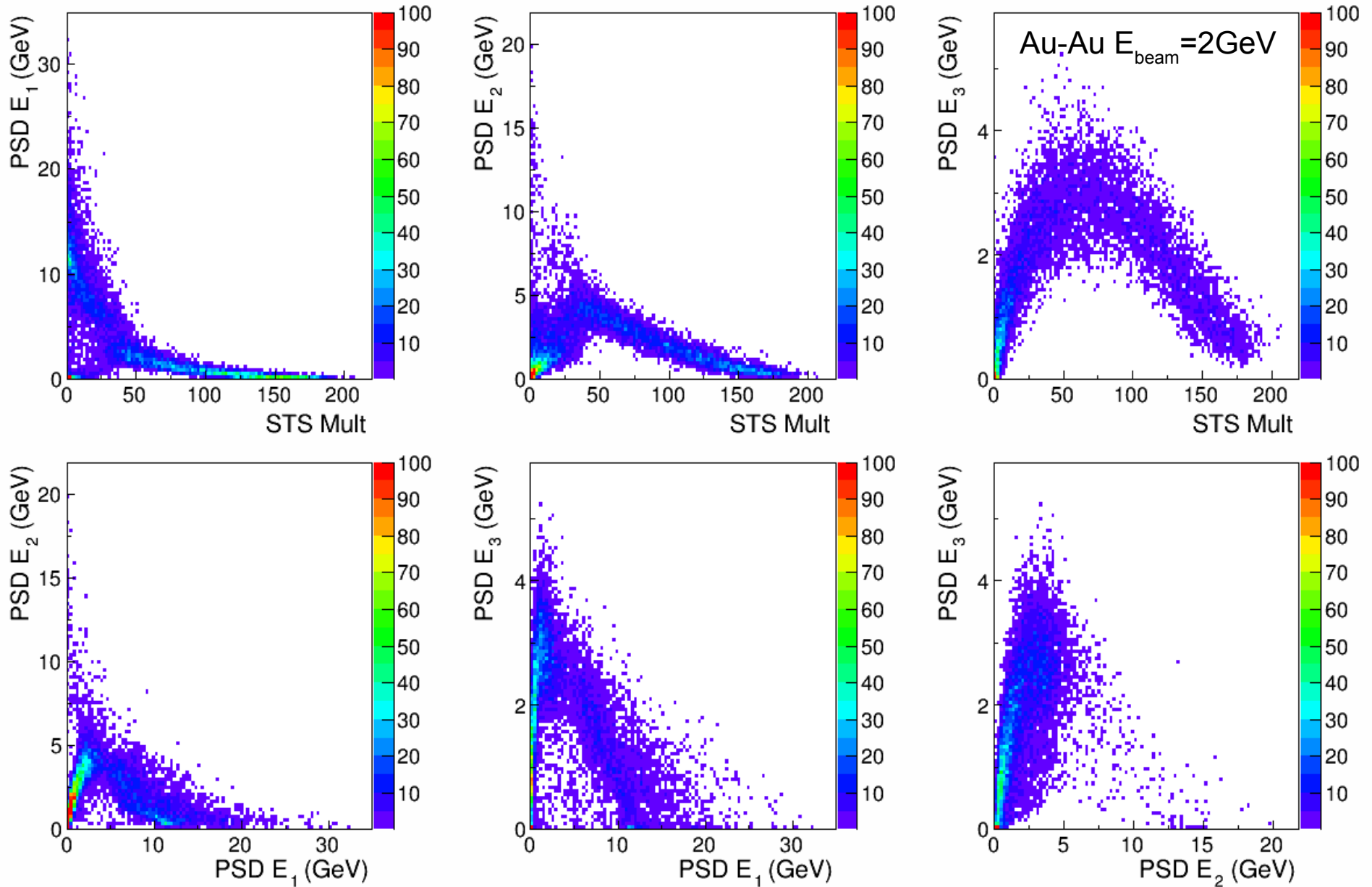


multiplicity correlation: STS vs. “beam-centered” PSD subevents



Additional PSD subevents can be used to improve the centrality resolution

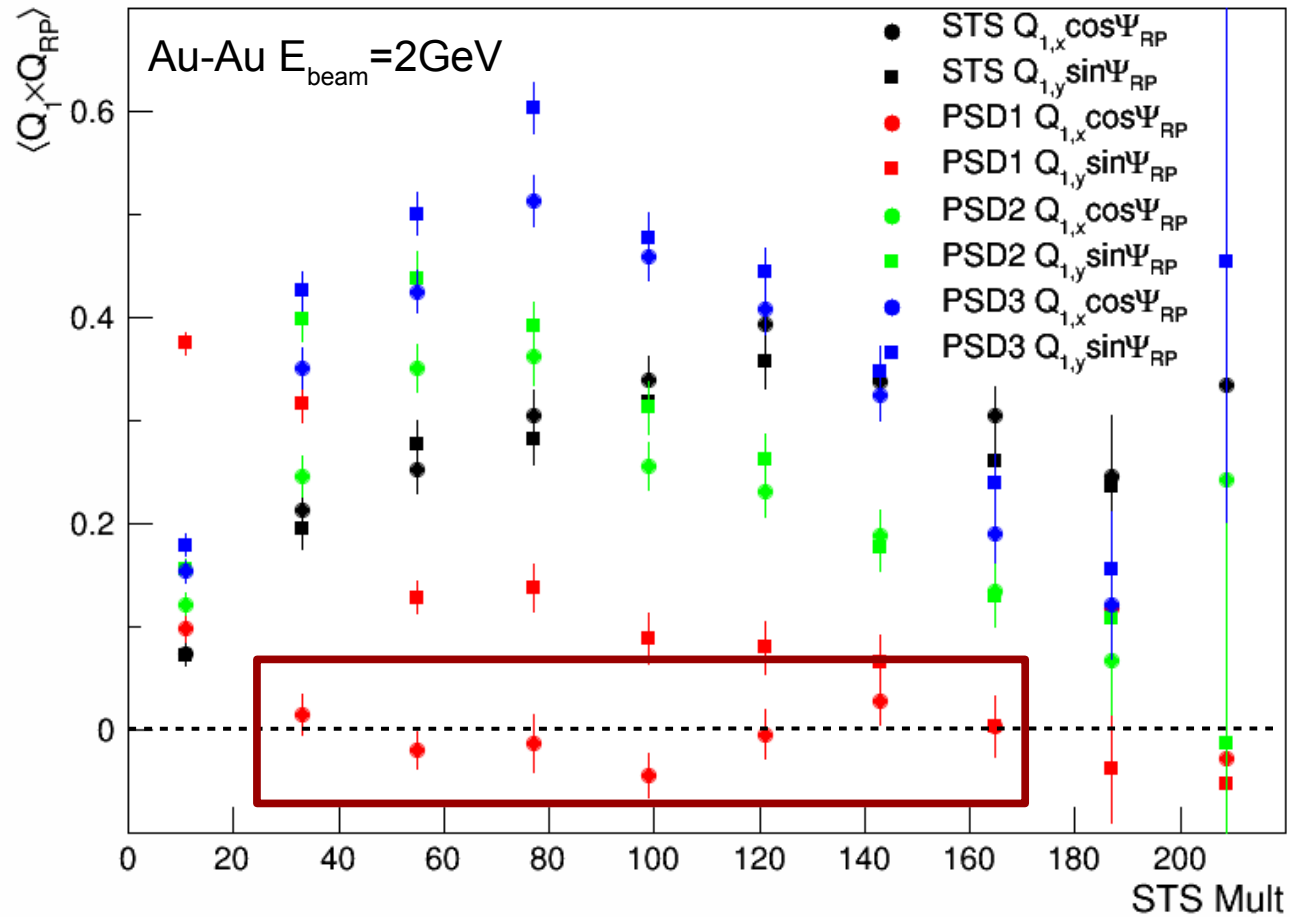
multiplicity correlation: STS vs. “lab-centered” PSD subevents



Additional PSD subevents can be used to improve the centrality resolution

Q-vector correlation wrt. to the reaction plane: STS vs. “beam-centered” PSD subevents

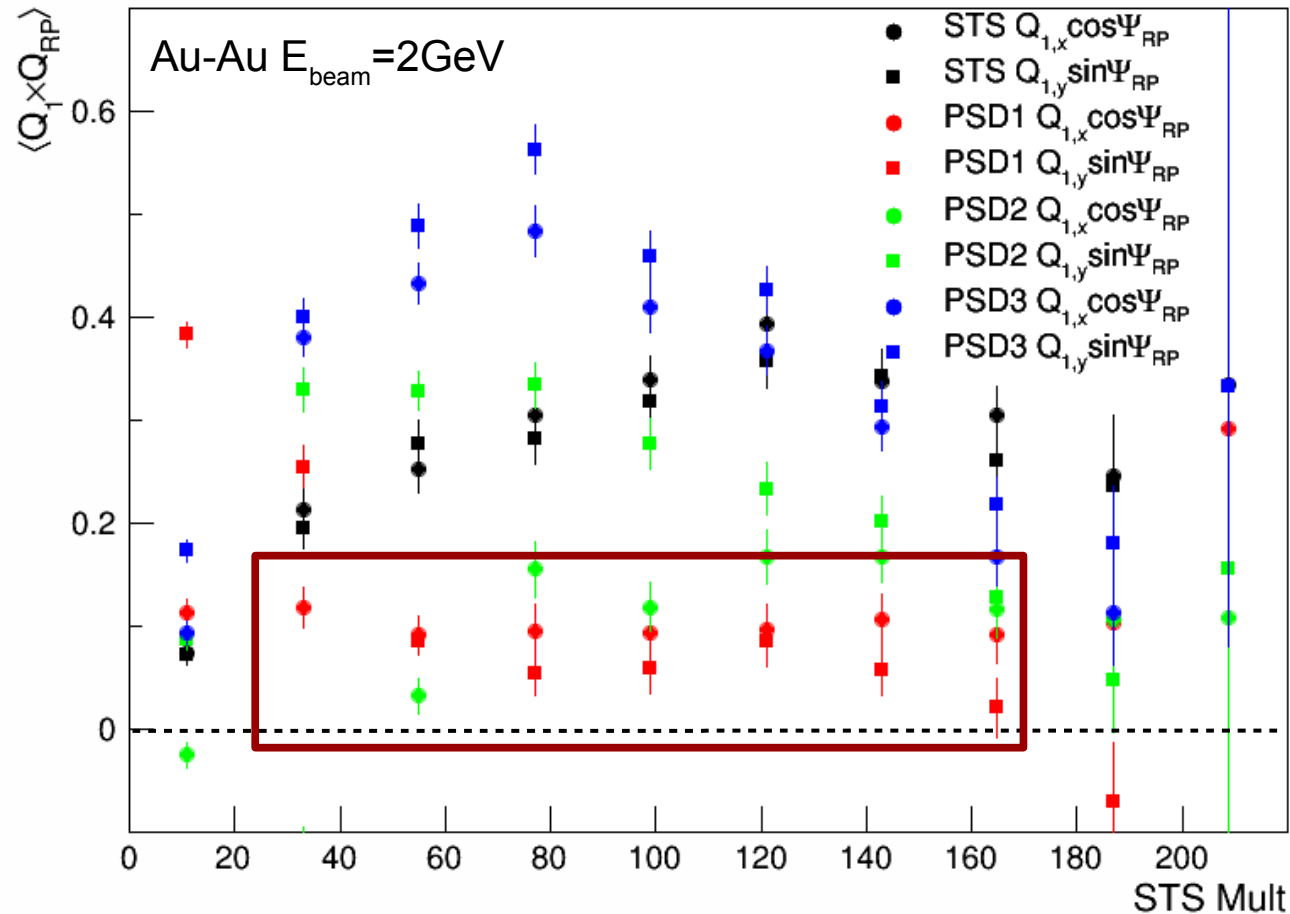
$$\langle Q_x \times \cos \Psi_{RP} \rangle \quad \langle Q_y \times \sin \Psi_{RP} \rangle$$



With 'beam' PSD subevents correlation in x-direction is lost
PSD1 subevent can not be used to construct the event plane angle

Q-vector correlation wrt. to the reaction plane: STS vs. “lab-centered” PSD subevents

$$\langle Q_x \times \cos \Psi_{RP} \rangle \quad \langle Q_y \times \sin \Psi_{RP} \rangle$$



- With 'lab'-subevents PSD1 correlations are recovered and is it raver symmetric for x and y directions: can be used for EP
- At the same time the PSD2 correlations in x-direction is reduced consider to extend the 'lab' subevents #2 with modules on the RHS.

Summary

- Elongated PSD geometry works
- PSD subevents can be used to improve centrality determination
- Additional PSD segmentation in the central region can be used for flow studies (need to introduce 'lab'-centered subevents)