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## The application of Hough transform for fast interaction vertex position estimation in heavy-ion collisions

Track reconstruction in high-multiplicity events, such as heavy-ion collisions at LHC, is a difficult and resource-demanding process. A priori knowledge of the collision vertex position would allow discarding non-viable track seeds, reducing the overall computing requirements for the track reconstruction. Traditionally, the vertex position is estimated only after the track reconstruction, making the seed pre-selection unfeasible. The novel method proposed in this poster uses the Hough transform to estimate the interaction vertex position without the necessity to reconstruct the tracks first. While it does not replace the traditional tracks-based vertex reconstruction, it offers an admissible resolution that is usable for seed filtering. Moreover, numerical complexity of the algorithm scales linearly with the track multiplicity, making it ideal for high-multiplicity events.

### Category

Experiment

### Collaboration (if applicable)

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