Vertex Reconstruction at STAR

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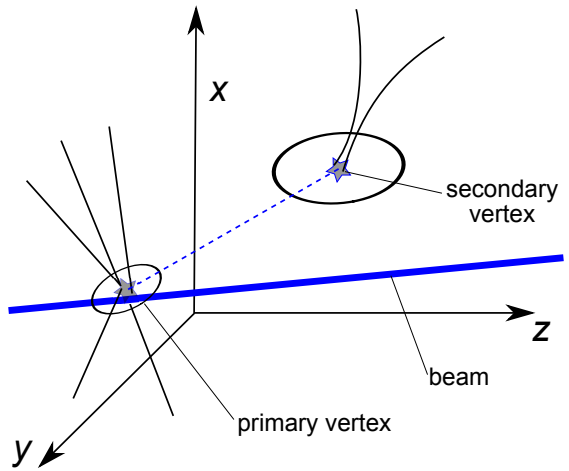
- Motivated by the upgrade of the STAR experiment with the high-precision silicon vertex detectors we reviewed the existing vertex finding algorithms currently employed by the STAR collaboration
- To help with evaluation and comparison of the vertex finders we developed a generic tool, `Travex`, that can be used to address similar tasks by other experiments
- We enhanced the STAR vertex finders by implementing 3D fits to primary vertices with proper beamline constraint and reporting of real uncertainties



- There is a strong indication that our improvements can benefit certain physics analyses relying on topology cuts for secondary vertex decays
- In Λ-enriched sample with realistic pile-up we observed an improvement in S/B of $\sim 10\%$