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Constraint Vertex Fitting in the ATLAS Experiment at LHC

On behalf of the ATLAS Collaboration.

The ATLAS collaboration at the Large Hadron Collider at CERN intends to study a variety of final states produced in proton-proton collisions at the energy of 14 TeV. The precise reconstruction of trajectories of charged and neutral particles including those which underwent decays is crucial for many phycics analyses. In addition, a study of tracking performance on the well-known benchmark channels will help understanding the properties of ATLAS detectors during the initial phase of the LHC. For instance, the investigation of correlations of parameters of the final state tracks having the same mother particle can help to correct for systematic effects in the alignment of the detector.

Described in this talk is the ATLAS framework for vertex reconstruction with simultaneous application of kinematic constraints. The implementation follows a very modular design based on object oriented C++.
A special emphasis is given on the use of the current approach in the alignment of the ATLAS detector and the reconstruction of exclusive decays.

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