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Optimization of the Adaptive Multi Vertex Finder in ATLAS

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The increasing track multiplicity in ATLAS poses new challenges for primary vertex reconstruction software, reaching to over 70 inelastic proton-proton collisions per beam crossing during Run-2 of the LHC and even more extreme vertex density in the next upcoming Runs. One way to get around these challenges, is to take a global approach to the track assignment to primary vertices, as opposed to the Iterative Vertex Finder procedure that was used in Run-2.

The Adaptive Multi Vertex Finder, a true multi-vertex implementation of the adaptive vertex finder algorithm is one such approach, which deploys the same adaptive vertex fitting technique as the Iterative Vertex Finder procedure, but fits for N vertices in parallel to take into account the vertex structure of the event.

This talk summarises the optimization and expected performance of the Adaptive Multi Vertex Finder for conditions foreseen for Run-3 of the LHC. These studies are coupled to a newly optimised vertexing seeder and further performance studies in the ITk scenario.

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Track Classification: 3: Advanced usage of tracks