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Performance of 4D tracking and vertexing with ACTS

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Four-dimensional trackers are devices capable of simultaneously measuring spatial and temporal coordinates with extremely good resolution ($O(10\ \mu\text{m})$ and $O(10\ \text{ps})$) and represent a promising avenue for charged-particle tracking. The ACTS library has the capability to include time information in track and vertexing reconstruction algorithms thanks to its 6-parameter track representation. In this work we present the physics and computational performance of 4-dimensional tracking and vertexing algorithms using the Open Data Detector as well as their application into more complex object reconstruction algorithms such as particle identification or heavy flavour jet tagging.

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