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Novel methods and expected Run II performance of ATLAS track reconstruction in dense environments

Detailed understanding and optimal track reconstruction performance of ATLAS in the core of high pT objects is paramount for a number of techniques such as jet energy and mass calibration, jet flavour tagging, and hadronic tau identification as well as measurements of physics quantities like jet fragmentation functions. These dense environments are characterized by charged particle separations on the order of the granularity of ATLAS's inner detector. With the insertion of a new innermost layer in this tracking detector, which allows measurements closer to the interaction point, and an increase in the centre of mass energy, these difficult environments will become even more relevant in Run II, such as in searches for heavy resonances. Novel algorithmic developments to the ATLAS track reconstruction software targeting these topologies as well as the expected improved performance will be presented.

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