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Reconstruction of high track density beams in beam tests

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The Inner Tracker of the ATLAS experiment requires the optimal performance of its pixel sensors. To test their efficiency, a reliable track reconstruction and analysis for testbeam data is necessary to ensure the precise detection of particles. The quality of data from testbeam campaigns are influenced by many factors, including high beam densities, which can impair the track reconstruction.
To analyse and evaluate the data taken at beam tests, the track reconstruction software Corryvreckan is used. It is now the predominant reconstruction framework for beam tests and was developed with the intention to reduce external dependencies without reducing the quality and versatility of track reconstruction in complex environments.
The reconstruction of particle tracks with too many hits becomes increasingly difficult due to the ambiguity of track fits. In order to differentiate between false and true reconstructed tracks, a machine learner is implemented, which is trained on simulated testbeam data, generated by the Allpix Squared software.
This talk presents results of the track reconstruction of high track density using Corryvreckan and the performance of a machine learner for true track tagging. Both simulated data and real testbeam data is investigated.

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