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TPC Track Reconstruction in CEPCSW

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CEPC will select pixelated readout to replace pad readout as the baseline of the Time Projection Chamber to obtain better PID performance. Due to ionization caused by incoming charge particle, 20-30 hits is generated on the pixelated readout within a 5x5mm area, possible to take more than one hits in same row, which goes against Kalma filter. This study employs a machine learning algorithm based on graph neural networks to merge hits within each 5x5mm area, resulting in a single hit position. Subsequently, trajectory reconstruction is performed on the merged hits in the TPC using tracking algorithms, and their performance is evaluated. The presentation will also cover the matching algorithm and performance of reconstructed trajectories in the TPC with those in the silicon detectors.

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