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Performing Track Reconstruction at the ALICE TPC using a Fast Hough Transform method

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The Hough Transform algorithm is a popular image analysis method that is widely used to perform global pattern recognition in images through the identification of local patterns in a suitably chosen parameter space. The algorithm can be also used to perform track reconstruction; to estimate the trajectory of individual particles when passed through the sensitive elements of a detector volume. This paper presents a fast reconstruction method for the Time Projection Chamber (TPC) of the ALICE experiment at LHC. The method, that combines a linear Hough Transform algorithm with a fast filling of the Hough Transform parameter space, is developed within ALICE O², the future computing framework of ALICE for RUN3.

Primary author: Dr KOUZINOPOULOS, Charalampos (CERN)

Co-author: Dr HRISTOV, Peter (CERN)

Presenter: Dr KOUZINOPOULOS, Charalampos (CERN)

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