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# Development of algorithms for cluster finding and track reconstruction in the forward muon spectrometer of ALICE experiment

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A simultaneous track finding / fitting procedure based on Kalman
filtering approach has been developed for the forward muon spectrometer of
ALICE experiment.
In order to improve the performance of the method in high-background
conditions of the heavy ion collisions the "canonical" Kalman filter has
been modified and supplemented by a "smoother" part. It is shown that
the resulting "extended" Kalman filter gives better tracking results and
offers higher flexibility.
To further improve the tracking performance in a high occupancy environment
a new algorithm for cluster / hit finding in cathode pad chambers of the
muon spectrometer has been developed. It is based on the expectation
maximization procedure for a shape deconvolution of overlapped clusters.
It is demonstrated that the proposed method allows to reduce the loss of the
coordinate reconstruction accuracy for high hit multiplicities and
achieve better tracking results.
Both the hit finding and track reconstruction algorithms have been
implemented within the AliRoot software framework.

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