

A novel machine learning approach for CLAS12 first-pass track estimation

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Abstract

The reconstruction of CLAS12 data begins with the invocation of an algorithm named SNR. SNR finds and removes uncorrelated drift chamber hits or "noise". A by-product of the algorithm is a series of extended (128 bit) words with bits set at sense wire locations corresponding to track segment candidates. Presently this segment data is discarded, and reconstruction continues in a traditional manner using the drift chamber data as cleaned by SNR but ignoring the resultant SNR segment candidates. In this work we investigate using the SNR track segment data as input for a machine learning algorithm, where the output is an estimate of the track parameters, i.e., the charge, vertex, momentum, and direction for each track.

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