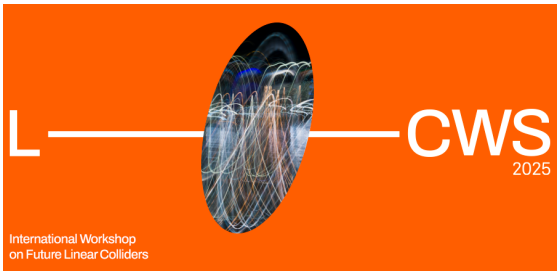

Contribution ID: **179** Type: **Talk**

Preliminary Implementation of Time in APRIL

Thursday 23 October 2025 13:00 (15 minutes)

This work presents a preliminary attempt to extend the Particle Flow Algorithm (PFA) APRIL by incorporating time information into its reconstruction framework. The goal is to improve cluster energy purity and efficiency, finally the overall Particle Flow Object (PFO) reconstruction quality.
Our main modification is to change the seeding based on timing information and the check the time causality. Specifically: In PFAs without timing (such as the current APRIL and Pandora), clustering seeds are defined by tracks for charged PFOs and by the spatial proximity of hits based on concept of pseudo-layers for neutral PFOs. In this implementation, for neutral PFOs, we instead use the earliest-time hits as seeds. Hits that are not causally compatible with the developing cluster are excluded, reducing contamination and improving the purity of reconstructed clusters.

Preliminary results on simulated data indicate that integrating timing information into APRIL can improve cluster energy purity. However, the impact on overall jet energy resolution (JER) requires further study.

Authors: LIANG, Hao (Centre National de la Recherche Scientifique (FR)); BOUDRY, Vincent (Laboratoire Leprince-Ringuet, CNRS/IN2P3, École polytechnique)

Presenter: LIANG, Hao (Centre National de la Recherche Scientifique (FR))

Session Classification: Software (Simulation, Reconstruction, MC generators & Machine Learning)

Track Classification: Software: Software (Simulation, Reconstruction, MC generators & Machine Learning)