



Contribution ID: 4

Type: **Plenary**

## Kinematic Kalman Filter Track Fit

*Tuesday 21 April 2020 20:00 (25 minutes)*

We will present the implementation of a kinematic Kalman filter-based track fit. The kinematic fit uses time as the free parametric variable to describe the charged particle's path through space, and as an explicit fit parameter ( $t_0$ ). The fit coherently integrates measurements from sensors where position is encoded as time (ie drift cells) with pure time sensors and geometric (solid-state) position sensors, including time-domain correlations. The kinematic formulation implicitly defines the particle mass and propagation direction, and provides a natural relativistic interface to both particle momentum and position. We will show results from testing the fit using a toy MC, and compare its performance to a conventional geometric Kalman filter fit when both are applied to simulations of the straw tracker design of the Mu2e experiment.

### **Consider for young scientist forum (Student or postdoc speaker)**

No

### **Second most appropriate track (if necessary)**

Enhanced performance of tracking algorithms

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**Session Classification:** Recording sessions