A Multithreaded Tracking Algorithm for E1039/SpinQuest[1]
NOAH WUERFEL, University of Michigan, SPINQUEST COLLABORATION —
The SpinQuest (Fermilab E1039) experiment will measure an azimuthal asymmetry in the Drell-Yan production of $\mu+$ $\mu-$ pairs from 120 GeV/c proton interactions with polarized nucleons to extract the Sivers function for $\bar{u}$ and $\bar{d}$. A nonzero asymmetry would be smoking gun evidence for orbital angular momentum of the light sea-quarks: a possible contributor to the protons spin. Reconstructing the primary physics event requires precision tracking of the dimuon pair against a combinatorial background of single muons produced in the beam dump. Raw data from the DAQ must be decoded and tracked in the 55 seconds between beam spills of the Fermilab main injector to provide online monitoring. Sequential tracking of events is too slow, but the prevalence of affordable, multi-CPU hardware makes a parallel solution an attractive possibility. In this talk, I will discuss the development and performance of multithreaded tracking algorithm, using ROOT tools, capable of parallel event tracking for the SpinQuest online monitoring system.

Noah Wuerfel
University of Michigan