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Novel Zooming Scale Hough Transform Pattern Recognition Algorithm for the PHENIX Detector THEODORE KOBLESKY, University of Colorado Boulder, PHENIX COLLABORATION — Single ultra-relativistic heavy ion collisions at RHIC and the LHC and multiple overlapping proton-proton collisions at the LHC present challenges to pattern recognition algorithms for tracking in these high multiplicity environments. One must satisfy many constraints including high track finding efficiency, ghost track rejection, and CPU time and memory constraints. A novel algorithm based on a zooming scale Hough Transform is now available in Ref [1] that is optimized for efficient high speed caching and flexible in terms of its implementation. In this presentation, we detail the application of this algorithm to the PHENIX Experiment silicon vertex tracker (VTX) and show initial results from Au+Au at $\sqrt{s_{NN}} = 200$ GeV collision data taken in 2011. We demonstrate the current algorithmic performance and also show first results for the proposed sPHENIX detector.

Ref [1] Dr. Dion, Alan. “Helix Hough” <http://code.google.com/p/helixhough/>

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