Contribution ID: **104** Type: **Parallel contribution**

Frequency Scanned Interferometry for ILC Tracker Alignment

Wednesday, August 10, 2011 6:05 PM (15 minutes)

In order to exploit fully the physics potential of future lepton colliders, highly precise tracking systems will be needed, for which systematic alignment uncertainties must be small. We describe ongoing R&D in frequency scanned interferometry (FSI) to be applied to alignment monitoring of a detector's charged particle tracking system, in addition to its beam pipe and final-focus quadrupole magnets. In FSI alignment, one measures hundreds of absolute point-to-point distances of detector elements in 3 dimensions by using an array of beams split from a central laser. We report here on progress using a dual-laser FSI single-channel prototype. Dual lasers with oppositely scanned frequency directions permit cancellation of many systematic errors, making the alignment robust against vibrations and environmental disturbances. Under realistic environmental conditions, a precision of about 0.2 microns was achieved for a distance of about 40 cm for the prototype. Work is now under way to demonstrate a multi-channel system on the bench. Recent progress will be summarized.

Primary author: Dr YANG, Haijun (University of Michigan)

Co-authors: Prof. RILES, Keith (University of Michigan); Mr CHEN, Tianxiang (University of Michigan)

Presenter: Dr YANG, Haijun (University of Michigan)

Session Classification: Detector Technology and R&D

Track Classification: Detector Technology and R&D