

Abstract Submitted
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Nanometer Vibration Control by Computer Feedback KEVIN MCLEOD, STEVEN SCHRAMM, JANIS MCKENNA, THOMAS MATTISON, Univ. British Columbia — The International Linear Collider is a planned electron-positron accelerator at the 500 GeV scale. Colliding nanometer sized beams requires control of vibrations of the final focusing magnets at the nanometer level. We are investigating position measurement with laser interferometry and position control with piezoelectric actuators using state-vector feedback in a near-real-time Linux computing environment. A custom driver for a commercial ADC-DAC card has the interferometer reconstruction and feedback algorithms inside an interrupt handler running at 10 kHz. Linux user applications interact with the driver for interferometer alignment and calibration, measurement of excitation of internal modes by the piezo, and measurement of external vibration spectrum. Other applications analyze the internal and external vibration modes, and calculate state-vector feedback gains. Graphical interface is provided by tcl/tk. Code development is in C with standard GNU tools, using a recursive generic makefile.

Kevin McLeod
Univ. British Columbia

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