

LONGITUDINAL BEAM DIAGNOSTICS FOR THE ILC INJECTORS AND BUNCH COMPRESSORS

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Abstract

We present a diagnostics suite and analyze techniques for setting up the longitudinal beam dynamics in ILC electron injectors and bunch compressors. Techniques to measure first order moment and recover the first order longitudinal transfer map of the injector intricate bunching scheme are presented. Coherent transition radiation diagnostics needed to measure and monitor the bunch length downstream of the ~ 5 GeV bunch compressor are investigated using a vector diffraction model. We finally introduce a new diagnostics capable of measuring time-transverse correlation along a single bunch. Such a diagnostics should be valuable for controlling emittance dilution via transverse wakefield and for properly setting the crab cavities needed for maximizing luminosity for non-zero crossing angle at the interaction point.

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