

Alignment Measurement of an X-Band Accelerator Structure Using Beam Induced Dipole Signals

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Abstract. Precise beam-to-structure alignment is critical for the acceleration of small emittance beams in linear accelerators. For the Next Linear Collider (NLC), a prototype accelerator structure has been developed in which the beam induced dipole mode signals can be readily accessed and processed to extract alignment information. In a test in the SLC linac, we used these signals to measure the internal alignment of the structure and to steer the beam in an attempt to minimize its wakefield. We used a second bunch to directly measure the wakefield and inferred from the results that a better than 40 micron alignment had been achieved. In this paper, we review these results and describe how we want to implement this alignment scheme for the approximately ten thousand structures in the NLC.

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