

KEKB Beam Collision Stability at the Picosecond Timing and Micron Position Resolution as observed with the Belle Detector

H.Kichimi, K.Trabelsi, S.Uehara, M.Nakao, K.Akai, T.Ieiri, M.Tobiyama, M.D.Jones, M.W.Peters, G.S.Varner, T.E.Browder

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Using the Belle detector we study the characteristics of beam collisions at the KEKB 3.5 GeV e^+e^- on 8 GeV e^-e^+ asymmetric energy collider. We investigate the collision timing $\{t_{\text{tip}}\}$ and its z -coordinate along the beam axis $\{z_{\text{ip}}\}$ as a function of the position of the colliding bunch in a beam train. The various $\{t_{\text{tip}}\}$ and $\{z_{\text{ip}}\}$ behaviors observed by Belle are attributed to beam loading effects in the radio frequency cavities that accelerate the beams with a beam abort gap. We report these results in detail and discuss the prospects for the SuperKEKB collider.

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