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The "Hour-Glass" Reduction Factor for Asymmetric Colliders

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Author

Furman, M.A.

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ABSTRACT

The "Hour-Glass" Reduction Factor for Asymmetric Colliders,* Miguel A. Furman, Accelerator and Fusion Research Division, Lawrence Berkeley Laboratory — We present the expression for the luminosity reduction factor for asymmetric colliders when either bunch length is comparable in size to any of the four beta functions at the interaction point. We assume that the bunches are three-dimensional gaussian; however, we do not assume any equality among the four beta-functions or the bunches' lengths or widths. We then apply our result to the proposed SLAC/LBL B-factory, resulting in a few percent reduction in luminosity from the zero-bunch-length estimate.

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Miguel A. Furman

AFRD/ESG, MS 71-H
Lawrence Berkeley Laboratory
Berkeley, CA 94720
(415) 486-6443

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