Abstract Submitted
for the APR05 Meeting of
The American Physical Society

A method for measurement of the top quark mass using the mean decay length of b hadrons in t-tbar events. J.M. LAMB, C.S. HILL, J.R. INCANDELA, University of California, Santa Barbara — We present a new method for the experimental determination of the top quark mass that is based upon the mean distance of travel of b hadrons in top quark events. The dominant systematic uncertainties of this method are uncorrelated with those of other methods, but a large number of events is required to achieve a small statistical uncertainty. Such large event samples are expected from Run II of the Fermilab Tevatron and the CERN Large Hadron Collider (LHC). By the end of Run II, a single experiment at the Tevatron could achieve a top quark mass uncertainty of $\sim$5 GeV/c^2 by this method alone. At the CERN LHC, our studies indicate that this method will likely be comparable to all other methods combined, which are expected to achieve an uncertainty of 1.5-2 GeV/c^2. This method could be used to cross-check other methods, or combined with them to obtain a substantially reduced overall uncertainty.

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Date submitted: 11 Jan 2005 Electronic form version 1.4