

A Measurement of the Branching Ratio  $R(B) = \Gamma(Z(0) \rightarrow B \text{ Anti-} B) / \Gamma(Z(0) \rightarrow \text{Hadrons})$  Using a Minimum Missing  $P(T)$  Corrected Mass Tag<sup>\*</sup>

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Abstract

A Measurement of the branching ratio  $R_b = \frac{\Gamma(Z^0 \rightarrow b\bar{b})}{\Gamma(Z^0 \rightarrow \text{hadrons})}$  using a minimum missing  $P_T$  corrected mass tag.

by Eric Ross Weiss

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Presented here is a new measurement of  $R_b = \Gamma(Z^0 \rightarrow b\bar{b})/\Gamma(Z^0 \rightarrow \text{hadrons})$  using a self-calibrating double tag technique where the  $b$  selection is based on topological and kinematic reconstruction of the mass of the  $B$ -decay vertex. The measurement was performed using a sample of 72074 hadronic  $Z^0$  events out of the 150k hadronic  $Z^0$  decays collected with the SLD at the SLAC Linear Collider during 1993-1995. The method utilizes the 3-D vertexing abilities of the SLD CCD pixel vertex detector and the small stable SLC beams to obtain a high  $b$  tagging efficiency of 35.3% for a purity of 98.0%. The high purity reduces the systematic uncertainty introduced by charm contamination and correlations with  $R_c$ . We obtain a result of  $R_b = 0.2142 \pm 0.0034_{\text{stat.}} \pm 0.0015_{\text{sys.}} \pm 0.0002_{R_c}$  (corrected for the  $e^+e^- \rightarrow \gamma$  exchange contribution).

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