

A Measurement of the Parity Violating Parameter $A(B)$ with Electrons at the SLD using a Neural Network*

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SANTA CRUZ

**A MEASUREMENT OF THE PARITY VIOLATING PARAMETER
 A_5 WITH ELECTRONS AT THE SLD USING A NEURAL
NETWORK**

A dissertation submitted in partial satisfaction of the
requirements for the degree of

DOCTOR OF PHILOSOPHY

in

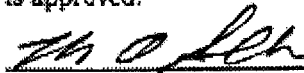
PHYSICS

by

Jorge Pablo Fernandez

December 1999

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Dean of Graduate Studies

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Abstract

A Measurement of the Parity Violating Parameter A_b with Electrons at the SLD
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The parity violating parameter A_b of the $Z^0 \rightarrow b\bar{b}$ coupling has been measured directly using the angular dependence of the Z^0 -pole polarized cross section. Bottom hadrons are tagged via semileptonic decays. The semileptonic channel used in this analysis is the electron channel. The analysis takes advantage of a new Neural Network algorithm to classify electrons according to the sources: $b \rightarrow e$, $b \rightarrow c \rightarrow e$, $c \rightarrow e$ and background events. Based on the 1996-1998 SLD sample of 350,000 Z^0 decays produced with highly polarized electron beams, this technique yields: $A_b = 0.877 \pm 0.050(\text{stat}) \pm 0.028(\text{syst})$.

Para mis queridos padres

Arturo

y

Gloria

and for my loving wife

Katherine

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