

**Observation of Excited  $B$  Mesons in  $p\bar{p}$  Collisions  
at  $\sqrt{s} = 1.8 \text{ TeV}$ .**

by

Dejan Vučinić

Submitted to the Department of Physics  
in partial fulfillment of the requirements for the degree of

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## Abstract

Production of orbitally excited ( $L = 1$ ) states of  $B$  mesons,  $B^{**}$ , is studied using a sample of nearly ten thousand partially reconstructed  $B$  mesons collected with the CDF detector from  $p\bar{p}$  collisions at  $\sqrt{s} = 1.8 \text{ TeV}$ . Ambiguities in the reconstruction of the  $B$  flavor and momentum are resolved. The fraction of  $b$  quarks that hadronize into an  $L = 1$  state is measured to be  $0.28 \pm 0.06(\text{stat}) \pm 0.03(\text{syst})$ , and the collective mass of the  $B^{**}$  states is measured to be  $m(B_1) = 5.71 \pm 0.02 \text{ GeV}/c^2$  given the mass splittings between the four states.

Thesis Supervisor: Paraskevas A. Sphicas

Title: Professor

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