

A Search for B Meson Decay to a Muon, a Neutrino, and a Photon

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**A Search for B Meson Decay to a Muon, a
Neutrino, and a Photon**

A Dissertation

Presented to the Faculty of the Graduate School

of

Yale University

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Doctor of Philosophy

by

Michael G. Greene

Dissertation Director: Homer Alfred Neal, Jr. II

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Abstract

A Search for B Meson Decay to a Muon, a Neutrino, and a Photon

Michael G. Greene

2004

This thesis describes a search for the rare decay $B^+ \rightarrow \mu^+ \nu_\mu \gamma$, performed at the Stanford Linear Accelerator Center. The BABAR detector is used to analyze 81.65 fb^{-1} of data, with $(88.6 \pm 0.6) \times 10^6$ charged B meson decays, from the PEP-II e^+e^- collider running at the $\Upsilon(4S)$ resonance. The background estimate for the analysis is three events, and three signal candidates are observed. An upper limit on the branching fraction is set at $\mathcal{B}(B^+ \rightarrow \mu^+ \nu_\mu \gamma) < 1.8 \times 10^{-5}$, at the 90% confidence level.

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