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Potential to Measure CP Violation in the Mode B(0) → D*+D*+ with the BaBar Detector*

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POTENTIAL TO MEASURE CP VIOLATION IN THE MODE $B^0 \to D^{*+}D^{*-}$ WITH THE BABAR DETECTOR

BY

G.J. PETER ELMER

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POTENTIAL TO MEASURE CP VIOLATION IN THE MODE $B^0 \to D^{*+}D^{*-}$ WITH THE BABAR DETECTOR

G.J. Peter Elmer

Under the supervision of Professor Sau Lan Wu

At the University of Wisconsin-Madison

A study of the potential of the BaBar detector at PEP II to measure CP violation using the vector-vector channel $B^0 \to D^{*+}D^{*-}$ is presented. The decay mode, although not a CP eigenstate, is sensitive to the angle β of the unitarity triangle, a fundamental measure of CP violation in the neutral B system. The decay mode $B^0 \to D^{*+}D^{*-}$ is reconstructed in a variety of channels and a study of the separation of the CP eigenstate contributions and extraction of the angle β is presented. The contribution of this channel is compared with other similar channels, and the overall prospects for measuring the angle β in the first years of BaBar running is summarized.

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