

SEARCH FOR LEPTON FLAVOUR VIOLATION IN THE DECAYS

$$\tau \rightarrow l\gamma \quad (l = e, \mu) \text{ AT } BABAR^*$$

Clay Lindsay[†], Swagato Banerjee, Chris Locke, Michael Roney

University of Victoria

Decays violating lepton flavor number, if observed, would be among the most theoretically clean signatures of new physics and the decays $\tau \rightarrow l\gamma$ ($l = e, \mu$) are two such processes. Incorporation of non-zero neutrino mass into the Standard Model allows for such a decay via neutrino oscillation at an estimated rate of 10^{-54} , which is experimentally unobservable. However there exist many models which can predict this at an experimentally observable rate (10^{-8}).

The B-factories provide an excellent environment for a charged LFV search. Now finished, the *BABAR* experiment has sufficient data to reach levels of 10^{-8} . Using 967×10^6 tau pairs collected between 1999 and 2008, including data taken at the $\Upsilon(2S)$, $\Upsilon(3S)$ and $\Upsilon(4S)$ resonances, we describe a search for these neutrinoless decays.

*Work supported by the Natural Sciences and Engineering Research Council of Canada and the National Research Council of Canada.

[†]*E-mail:* clayton@uvic.ca