

Abstract Submitted
for the DNP13 Meeting of
The American Physical Society

Radiative Beta Decay for Studies of CP Violation¹ SUSAN GARDNER, DAHENG HE, University of Kentucky — A triple-product correlation in the radiative β decay rate of neutrons or of nuclei, characterized by the kinematical variable $\xi \equiv (\mathbf{l}_\nu \times \mathbf{l}_e) \cdot \mathbf{k}$, where, e.g., $n(p) \rightarrow p(p') + e^-(l_e) + \bar{\nu}_e(l_\nu) + \gamma(k)$, can be generated by the pseudo-Chern-Simons term found by Harvey, Hill, and Hill as a consequence of the baryon vector current anomaly and $SU(2)_L \times U(1)_Y$ gauge invariance at low energies. The correlation probes the imaginary part of its coupling constant, so that its observation at anticipated levels of sensitivity would reflect the presence of sources of CP violation beyond the standard model. We compute the size of the asymmetry in $n \rightarrow pe^-\bar{\nu}_e\gamma$ decay in chiral effective theory, compare it with the computed background from standard-model final-state interactions, and consider the new physics scenarios which would be limited by its experimental study.

¹Work supported in part by the U.S. Department of Energy Office of Nuclear Physics under contract no. DE-FG02-96ER40989

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Date submitted: 01 Jul 2013

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