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Beta Decay for Studies of CP Violation¹

SUSAN GARDNER, University of Kentucky

The triple-product correlations observable in ordinary neutron or nuclear beta decay are all naively T violating and can connect, through an assumption of CPT invariance, to constraints on sources of CP violation beyond the Standard Model (SM). They are also spin dependent. I will review the constraints such studies offer on physics beyond the SM, and the manner in which they complement constraints from the nonobservation of permanent electric dipole moments. In this context the study of radiative beta decay opens a new possibility, in that a triple-product correlation can be constructed from momenta alone. Consequently its measurement would constrain new spin-independent sources of CP violation. I will describe these, and the implications of possible experimental constraints, in light of the size of the triple momentum correlation in the radiative decay rate arising from electromagnetic final-state interactions in the SM.

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