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CP violation in boosted top quark decay

We propose a novel observable in boosted top quark decay, which can be used to measure the anomalous Wtb interaction. The observable is an angular correlation between the $t \to bW$ decay plane and the $W \to f\bar{f}'$ decay plane, which is related to the polarization of W. We show that a forward-backward asymmetry of the angular distribution is sensitive to complex phases in the Wtb anomalous couplings for both leptonic and hadronic decay modes of top quark. In this work, we analyze the prospects of probing the CP violation in the $t\bar{t}$ system at future lepton colliders.

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