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Probing the CP Violating top Yukawa coupling at the LHC

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We study Higgs boson production associated with single top or anti-top via t-channel weak boson exchange at the LHC. The process is an ideal probe of the top quark Yukawa coupling, because we can measure the relative phase of htt and hWW couplings, thanks to the significant interference between the two amplitudes. Both the azimuthal asymmetry and the polarization perpendicular to the scattering plane are found to have the opposite sign between the top and anti-top events. We identify the origin of the sign of asymmetries, and propose the possibility of direct CP violation test in pp collisions by comparing the top and anti-top polarization at the LHC.

You are

non-PhD student

Primary authors: Prof. HAGIWARA, Kaoru; Prof. BARGER, Vernon; ZHENG, Ya-Juan

Presenter: ZHENG, Ya-Juan

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