

Testability of CP-even axion-like particle at ILC

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Axion and axion-like particles (ALPs) are attractive candidates of light dark matter (DM). They emerge as a pseudo-Nambu Goldstone boson in spontaneously breaking of global U(1) symmetry in the dark sector. The mass is obtained by the explicit breaking of the U(1). In many new physics models, it is usually assumed that the dark sector, in which axion/ALP exists, is CP conserving. In contrast to such a previous study, we take into account CP-violation in the dark sector, considering a simple renormalizable model where a dark Higgs field is only added. In this talk, we discuss the properties and phenomenological aspects of the predicted ALP. In particular, we demonstrate that the ALP can be probed by the SM-like Higgs boson decay into a pair of ALP at the ILC and the various signal can happen, i.e. Higgs invisible decay, displaced vertices and Higgs exotic decays.

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