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Probe Light Scalars in 2HDMs at FASER

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Two Higgs Doublet Model (2HDM) offers a prototype beyond the Standard Model (SM) with an extended Higgs sector. It provides a rich spectrum of scalars, of which some can be relatively light with weak couplings to the SM particles. Complementary to the usual searches for extra scalars at high energy colliders, FASER offers a unique opportunity to study those relatively long-lived light scalars. Given all the existing theoretical and experimental constraints, we consider the light CP-even and CP-odd scalars in the four different types of 2HDMs, and examine the parameter window which can be probed at FASER.

Summary

Primary author: SONG, Huayang (University of Arizona)

Co-authors: KLING, Felix (University of Arizona); LI, Shuailong; SU, Shufang (University of Arizona); SU, wei (University of Adelaide)

Presenter: SONG, Huayang (University of Arizona)

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