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Seeking a light CP-odd Higgs state

We propose to look for the light CP-odd state through the decay $h \rightarrow P\ell^+\ell^-$, where P stands for a pseudoscalar quarkonia. We show that the corresponding branching fraction can be enhanced as much as by a factor ~ 20 -30 in the models with two Higgs doublets of Type I, II or X. In this study we consider $m_A < m_h$ but larger than ~ 20 GeV. We then show a special case of a very light CP-odd Higgs, and show how its presence can be efficiently tested through $\eta_{c,b} \rightarrow \ell\ell$ modes.

Experimental Collaboration

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