

Title: Probing the scalar-pseudoscalar mixing in the 125 GeV Higgs particle with current data

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Abstract: LHC has found hints for a Higgs particle of 125 GeV. We investigate the possibility that such a particle is a mixture of scalar and pseudoscalar states. For definiteness, we concentrate on a two-Higgs doublet model with explicit CP violation and soft Z(2) violation. Including all Higgs production mechanisms, we determine the current constraints obtained by comparing $h \rightarrow \gamma\gamma$ with $h \rightarrow VV^*$, and comment on the information which can be gained by measurements of $h \rightarrow b\bar{b}$ (b) over bar. We find bounds $|\sin(2\beta)| \leq 0.83$ at one sigma, where $|\sin(2\beta)| = 0$ ($|\sin(2\beta)| = 1$) corresponds to a pure scalar (pure pseudoscalar) state.

KeyWords Plus: Electroweak Symmetry-Breaking; Standard Model; CP Violation; Roots-S=7 TeV; LHC; Boson; Anatomy

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