



HEP 2013
Stockholm
18-24 July 2013



Contribution ID: 278

Type: **Poster Presentation**

Higgs properties in a softly broken Inert Doublet Model

In this talk, I would like to present a model with two scalar doublets with a softly broken Z_2 symmetry is presented. In this model, one of them acquire a vacuum expectation value (vev) and breaks the electroweak symmetry. The other doublet, which is fermiophobic, has no vev. Because of the breaking of the Z_2 symmetry, the model can lead to a distinct and novel phenomenology. For instance, the model contains a charged scalar state which can be light and has W gamma as the dominant decay mode. The model can also reproduce the signal of the newly observed state at the LHC with mass ~ 125 GeV.

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Track Classification: Higgs and New Physics