SUSY 2016



Contribution ID: 129

Type: Poster

The 750 GeV diphoton LHC excess from Singlets in Exceptional Supersymmetric Standard Model

The 750-760 GeV diphoton resonance may be identified as one or two scalars and/or one or two pseudoscalars contained in the two singlet superfields $S_{1,2}$

arising from the three 27-dimensional representations of E_6 . We study the corresponding collider signature within the exceptional supersymmetric standard model (E_6SSM). This model is based on the SM gauge group together with an extra $U(1)_N$ gauge symmetry under which right-handed neutrinos have zero charge. To ensure anomaly cancellation the low energy matter content of the E_6SSM involve three 27 representations of E_6 . Thus E_6SSM predicts Z' boson and extra matter beyond the MSSM. In particular, the low-energy spectrum of the E_6SSM involves three families of Higgs-like doublets, three families of exotic quarks and three SM singlets S_i that carry $U(1)_N$ charges. The E_6SSM Higgs sector contains one family of the Higgs-like doublets and one SM singlet S_3 that develops vacuum expectation values (VEV) breaking $U(1)_N$ gauge symmetry and inducing masses of exotic states mentioned above. The fermion and scalar components of other Higgs-like superfields form Inert Higgsino and Inert Higgs states respectively. Two lighter singlets $S_{1,2}$ with masses around 750 GeV can couple to Inert Higgsino and exotic quarks giving rise to diphoton

excess. We calculate the branching ratios and cross-sections for the two scalar and two pseudoscalar states associated with the $S_{1,2}$ singlets, including possible degeneracies and maximal mixing, subject to the constraint that their couplings remain perturbative up to the unification scale.

 Author:
 NEVZOROV, Roman (University of Adelaide)

 Co-author:
 KING, Stephen

 Presenter:
 NEVZOROV, Roman (University of Adelaide)

Session Classification: Non-SUSY and Exotics

Track Classification: Non-SUSY and Exotics