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

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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 ( $E_6$ SSM). 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  $E_6$ SSM involve three 27 representations of  $E_6$ . Thus  $E_6$ SSM predicts  $Z'$  boson and extra matter beyond the MSSM. In particular, the low-energy spectrum of the  $E_6$ SSM 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  $E_6$ SSM 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.

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