

Associate production of light scalars at the LHC

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We investigate the associated production of light scalars at the Large Hadron Collider (LHC) within the framework of the Two Real Singlet Model (TRSM). This model extends the Standard Model by introducing two real singlets, which interact with Standard Model particles through their mixing with the Higgs boson. Our study focuses on the physics process $\gamma\gamma \rightarrow \gamma h_2$, where γ represents γ^\pm or Z bosons and h_2 is an additional scalar in the model. The final state of this process consists of four low mass b -jets and the leptonic decays of γ^\pm/Z bosons. In our analysis, we consider scenarios where the masses of these additional scalars are less than the SM-like Higgs boson mass $m_h = 125.09$. Our findings are derived using standard collider phenomenology tools. We found that these low mass final states $4b\text{-jet} + \gamma^+\gamma^+$, or $\gamma^-\gamma^+$, or $\gamma^+\gamma^-$ could be promising for shining light to new physics BSM at the LHC

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