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Search for new physics in an extended Higgs sector in the 4b final state MARC OSHERSON, EVA HALKIADAKIS, SCOTT THOMAS, Rutgers, The State University of New Jersey, REBECCA KOWALSKI, Johns Hopkins University, CMS COLLABORATION — The discovery of the standard model Higgs boson at the LHC does not exclude an extended Higgs sector. There are many possible variations of such a model, but one feature is true in general: if such a sector has an approximate global symmetry and spontaneous symmetry breaking, there exist two scalar particles which we have not yet discovered. The heavier of these (X) would have a large branching fraction to the lighter of the two (a), which itself has Higgs-like couplings. One of the most prominent signatures of this extended Higgs sector would be $X \rightarrow aa \rightarrow (bb)(bb)$, at least if the mass of the a is less than twice that of the top quark. In this talk, we present the first search for this model in proton-proton collisions, using data collected by CMS at a center of mass energy of 13 TeV, and corresponding to an integrated luminosity of 137 fb^{-1} . In particular, we consider the case where the mass of the X is sufficiently large compared to that of the a such that each pair of b-quarks is reconstructed as a single large radius jet with substructure. We present cross-section limits as a function of both the X and a masses, and propose extensions of the analysis to further probe the range of possible extended higgs sectors.

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