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New Physics in Triboson Event Topologies

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We present a study of the sensitivity to models of new physics of proton collisions resulting in three electroweak bosons. As a benchmark, we analyze models in which an exotic scalar field ϕ is produced in association with a gauge boson ($V = \gamma$ or Z). The scalar then decays to a pair of bosons, giving the process $pp \to \phi V \to V'V''V$. We interpret our results in a set of effective field theories where the exotic scalar fields couple to the Standard Model through pairs of electroweak gauge bosons. We estimate the sensitivity of the LHC and HL-LHC datasets and find sensitivity to cross sections in the 10 fb – 0.5 fb range, corresponding to scalar masses of 500 GeV to 2 TeV and effective operator coefficients up to 35 TeV.

Authors: CARPENTER, Linda; SMYLIE, Matthew; CARIDAD RAMIREZ, Jesus Manuel (University of California Irvine (US)); MCDOWELL, Cameron; WHITESON, Daniel (University of California Irvine (US))

Presenter: SMYLIE, Matthew

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