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Uncovering New Higgs Bosons in the ATLAS Analysis of Differential t - t bar Cross-sections

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ATLAS found that none of the various Standard Model simulations used by them can describe the differential lepton distributions measured in their t bar analysis reasonably well. Therefore, we take the possibility that this measurement might have new physics contamination and study a benchmark model motivated by existing indications for di-photon resonances: A heavy scalar decays into two lighter Higgs bosons with masses of 152 GeV and 95 GeV. Subsequently, the lighter Higgs bosons decay to WW and bb , respectively. We find that in this case, the description of data is very much improved, resulting in a preference for the new physics model over the Standard Model hypothesis of at least 5.6 sigma.

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