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Combination of searches for heavy resonances decaying to WW, WZ, ZZ, WH, and ZH boson pairs in proton–proton collisions at √s=8 and 13 TeV (Article) (Open Access)

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Abstract

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A statistical combination of searches is presented for massive resonances decaying to WW, WZ, ZZ, WH, and ZH boson pairs in proton–proton collision data collected by the CMS experiment at the LHC. The data were taken at centre-of-mass energies of 8 and 13 TeV, corresponding to respective integrated luminosities of 19.7 and up to 2.7 fb^{-1}. The results are interpreted in the context of heavy vector triplet and singlet models that mimic properties of composite-Higgs models predicting W′ and Z′ bosons decaying to WZ, WW, WH, and ZH bosons. A model with a bulk graviton that decays into WW and ZZ is also considered. This is the first combined search for WW, WZ, WH, and ZH resonances and yields lower limits on masses at 95% confidence level for W′ and Z′ singlets at 2.3 TeV, and for a triplet at 2.4 TeV. The limits on the production cross section of a narrow bulk graviton resonance with the curvature scale of the warped extra dimension $\tilde{k}$=0.5, in the mass range of 0.6 to 4.0 TeV, are the most stringent published to date.

Author keywords

CMS Combination Di-boson Physics Resonances

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