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Search for invisible Higgs decays in the VBF channel using the CMS detector

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All measurements of the 125 GeV boson to date indicate compatibility with a SM Higgs boson, but the associated uncertainties are large, and the possibility for non-SM properties remains. In addition, although additional SM-like Higgs bosons have been excluded over a wide mass range, additional Higgs bosons with exotic decay modes remains a possibility, and are predicted by many models. Invisible Higgs boson decay modes are possible, for example, through decays to neutralinos in supersymmetric models, or graviscalars in models with extra dimensions.

A search for invisible decays of Higgs bosons is present using the vector boson fusion production mode, using the full 2012 $\sqrt{s} = 8$ TeV dataset recorded by the CMS experiment. Events are selected with a dedicated trigger based on the vector boson fusion tag jet topology, together with large missing transverse energy. The offline selection makes further use of the tag jet topology. The results of this analysis were further combined with the associated production ZH channel to obtain additional sensitivity.

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