

Abstract Submitted
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Validation of the Higgs boson spin-parity analysis with $Z \rightarrow 4l$ data JEFFREY ROSKES, Johns Hopkins Univ, CMS COLLABORATION — A validation of the matrix element likelihood approach, used to study the spin-parity and anomalous interactions of the Higgs boson, is presented. Data from pp collisions, corresponding to an integrated luminosity of 5.1 fb^{-1} at center-of-mass energy of $\sqrt{s} = 7 \text{ TeV}$ and 19.7 fb^{-1} at $\sqrt{s} = 8 \text{ TeV}$, have been recorded with the CMS detector at the LHC. The analysis is applied to study the Z boson, which already has established Standard Model properties, allowing for presence of an alternative Higgs boson with the same mass and width as the Z boson, in the decay channel Z or $H(91.2) \rightarrow 4l$. The non-resonant $q\bar{q} \rightarrow 4l$ contribution is parameterized, including interference with $q\bar{q} \rightarrow Z \rightarrow 4l$, and its effective fractional cross section is fitted in the data. The alternative Higgs-like hypothesis $H(91.2)$ is excluded at higher than 99.99% confidence level.

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