

Abstract Submitted
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Study of the inclusive four-lepton lineshape in proton-proton collisions at $\sqrt{s} = 8$ TeV with the ATLAS detector at the LHC BING LI, USTC and University of Michigan, ATLAS COLLABORATION — The inclusive four-lepton lineshape is studied using data corresponding to 20.3 fb^{-1} of integrated luminosity from proton-proton collisions at $\sqrt{s} = 8$ TeV at the LHC collected with the ATLAS detector. The mass spectrum is analyzed in the range 80–1000 GeV, where several distinct physics processes contribute. These include the single resonant processes $q\bar{q} \rightarrow Z \rightarrow 4\ell$, Higgs production $g\bar{g} \rightarrow H \rightarrow ZZ^* \rightarrow 4\ell$, as well as continuum ZZ production processes $q\bar{q} \rightarrow ZZ^*4\ell$ and $g\bar{g} \rightarrow ZZ^* \rightarrow 4\ell$. A total of 476 four-lepton events are found in the signal region, allowing for a measurement of the total cross section, as well as the differential cross section versus the four-lepton invariant mass. In addition, the first measurement is made of the non-resonant gluon-gluon fusion component in the four-lepton mass region where both Z bosons are produced on shell.

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