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Search for Zγ high-mass resonances using the ATLAS Detector

This study presents a search for the high-mass resonances in $Z\gamma$ final states. The search is performed using the Monte Carlo simulated signal samples of mass up to 5 TeV, corresponding to an integrated luminosity of 139 fb^{-1} dataset recorded by the ATLAS experiment in proton-proton collisions during the LHC Run-2. Only leptonic decay of the Z boson to a lepton-antilepton pair $\ell^+ \ell^-, \ell = e, \mu$ is considered, and the analysis search for a localized excess in the invariant mass distribution of reconstructed final state over a smoothly-falling background emanating from Standard Model processes. The characterization of signal shape for the mass spectrum from gluon fusion (ggF) production mode is modelled by a double-sided crystal ball function form and the background shape modelling is performed using analytic functions of different order. The systematic uncertainties are incorporated, which arise from uncertainties on the energy scale of the reconstructed final states and on the possible bias (spurious signal) on the fitted signal yield due to the choice of background function.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

PhD

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