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Search for high-mass resonant phenomena with same-charge lepton pairs in the final state using pp collisions at $\sqrt{s}$=13 TeV with the ATLAS detector at the LHC

A search for new high mass resonances which decay to two high-p_{T} leptons with same-sign charge is presented. The results reported here use the \textit{pp} collision data sample corresponding to 36.5 fb^{-1} of integrated luminosity collected in 2015 and 2016 by the ATLAS detector at the LHC with a centre-of-mass energy of 13 TeV. The search considers the pair production of a doubly charged Higgs boson via the Drell-Yan process as a benchmark model where the decay mode is assumed to be exclusively into leptons. A model independent search will also be performed on distinct event categories, defined by the number of same-sign lepton pairs. This search will focus on signal regions definition and on the strategy for the estimation of the main backgrounds: mis-identified (fake) prompt leptons, originating from either hadronic jets or secondary weak hadron decays, and electrons with mis-identified charge. The search will be performed in all light lepton flavor channels, allowing also the doubly charged Higgs to decay to mixed lepton flavor final states via lepton number violation. A limit on the mass of the doubly charged Higgs boson, for both left-handed and right-handed particle states, will be set.

Experimental Collaboration

ATLAS

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