

Search for scalar leptoquarks in the $b\tau\tau$ final state in pp collisions at $\sqrt{s} = 13$ TeV with the ATLAS detector

A search for singly-produced scalar leptoquarks decaying to $b\tau$ in proton-proton collisions is performed using Run 2 data from LHC corresponding to an integrated luminosity of 139 fb^{-1} at $\sqrt{s} = 13$ TeV recorded by the ATLAS detector. The signal benchmark model considered is a scalar leptoquark with an electric charge of $4/3e$ and quantum numbers $3B + L = -2$, which decays exclusively into a b -quark and a τ -lepton. The mass range searched is from 0.4 TeV to 2.5 TeV. No significant excess above the Standard Model prediction is observed, and 95% confidence-level upper limits are provided on the production cross-section times branching fraction of leptoquarks decaying to $b\tau$. Considering both single and pair leptoquark production processes, under the assumption of exclusive decays of scalar leptoquarks to $b\tau b\tau$, leptoquark masses below 1.26 TeV, 1.30 TeV and 1.41 TeV are excluded for a Yukawa coupling to b -quark and τ -lepton of 1.0, 1.7 and 2.5.

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