

# Search for scalar leptoquarks in the $b\tau$ final state with the ATLAS detector

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This talk will present a search for scalar leptoquarks in  $b\tau$  final state using a data sample corresponding to  $139 \text{ fb}^{-1}$  of proton–proton collisions recorded at a center-of-mass energy of  $\sqrt{s} = 13 \text{ TeV}$  with the ATLAS detector at the Large Hadron Collider. The signal benchmark model considered is a scalar leptoquark with an electric charge of  $4/3e$  and quantum numbers  $3_B + L = -2$ , which decays exclusively into a  $b$ -quark and a  $\tau$ -lepton. The talk will outline the main part of the analysis, from the event selection to the background estimation and the result extraction through a fit performed on the signal regions.

No significant excess above the Standard Model prediction is observed in the explored leptoquark mass range (0.4–2.5 TeV), and 95% confidence-level upper limits are set on the production cross-section times branching fraction of leptoquarks decaying to  $b\tau$ . Based on the analysis results leptoquark masses below 1.26 TeV, 1.30 TeV and 1.41 TeV are excluded for a scalar leptoquark Yukawa coupling to  $b$ -quark and  $\tau$ -lepton of 1.0, 1.7 and 2.5, respectively.

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