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Search for di-jet resonances along with an isolated charged lepton at $\sqrt{s}=13$ TeV pp collision with the ATLAS detector

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A search for dijet resonances in events with identified leptons has been performed using the full Run 2 data collected in pp collisions at $\sqrt{s}=13$ TeV with the ATLAS detector, corresponding to an integrated luminosity of 139 fb^{-1} . The dijet invariant-mass (m_{jj}) distribution from events with at least one isolated electron or muon was probed in the range of $0.22 < m_{jj} < 6.3$ TeV. The analysis probes much lower m_{jj} than traditional inclusive dijet searches and is sensitive to a large range of new physics models in association with a final-state lepton. As no statistically significant deviation from the Standard Model background hypothesis was found, limits were set on contributions from generic gaussian signals and on various beyond-the-Standard Model (BSM) scenarios including the Sequential Standard Model, a charged Higgs boson model, a simplified Dark Matter model etc. It has also been studied that the multi-body invariant masses such as three- and four-body invariant mass distributions constructed from jets and leptons while following the same analysis strategy provide sensitivity to wide ranges of Physics, including many BSM scenarios.

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