

# Search for first generation scalar leptoquarks in pp collisions at 13 TeV with CMS

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The quark and lepton sectors of the standard model (SM) are strikingly similar in terms of the number of particles and generations. This hints at a fundamental symmetry existing between the two sectors. Indeed, such a symmetry is part of many beyond-the-SM theories such as composite models, technicolor, grand unified SU(5), Pati-Salam SU(4) and E6 superstring-inspired theories. These models give rise to a new class of bosons called leptoquarks (LQs) that carry both baryon and lepton numbers – a signature of their coupling to quarks and leptons. They are colored objects with fractional electric charge, and could be either scalar or vector particles. An LQ decays into a lepton and a quark, giving rise to a final state of high-momentum leptons and jets. We perform a dedicated search for pair-produced first generation scalar leptoquarks, resulting in a final state of two electrons and at least two jets; and one electron, missing transverse energy and at least two jets, using pp collision data taken at centre-of-mass energy of 13 TeV. The data were recorded with the CMS detector during the 2016 running of the LHC, and correspond to an integrated luminosity of 35.9 fb<sup>-1</sup>.

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