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Searches for new physics with leptons using the ATLAS detector

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Many theories beyond the Standard Model (SM) predict that New Physics (NP) will manifest by decaying into final states involving leptons. Leptoquarks are predicted by different NP theories to describe similarities between the lepton and quark sectors of the SM. Other NP theories relating to quantum gravity predict periodic signatures in dilepton final states, where tightly-spaced resonance towers detectable at LHC energies provide access to very small couplings through a mechanism coined Clockwork. This talk will present the most recent 13 TeV results of searches for leptoquarks with the ATLAS detector, covering flavour-diagonal and cross-generational final states, as well as a novel search for Clockwork signals in diphoton and dielectron final states.

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