Tau-Lepton in searches and in Measurements at the LHC

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The tau-lepton as the heaviest charged lepton in the standard model (SM) of particle physics is particulary sensitive to effects related to the mass of leptons at the Large Hadron Collider (LHC). This includes the Yukawa coupling of the tau-lepton to the Higgs boson, as well as potential effects from physics beyond the SM (BSM), such as off-diagonal terms in the Higgs-Yukawa coupling or enhancements of the anomalous magnetic moment of the tau-lepton. The short lifetime of the tau-lepton and its reconstruction through the decay products make the measurements and searches involving the tau-lepton experimentally challenging. In this talk, a selection of measurements and searches is discussed, showing the unique potential of the tau-lepton in understanding the SM and probing for BSM physics with the ATLAS detector.