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Search for charged long-lived heavy particles with the ATLAS experiment at the LHC

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We report on the search for charged long-lived heavy particles, predicted by several theories beyond the Standard Model. Such particles are potentially detectable at the LHC, given either their anomalous dE/dx loss measurable in the ATLAS Pixel detector, or their slow motion ($\beta < 1$) which can be detected by the Tile Calorimeter, or even their possible muon-likeness identified by the Muon Spectrometer. In particular, the Pixel-based search, measuring the track parameters in the vicinity of the interaction point, is eagerly sensitive to possible metastable particles, or to changes in the charge due to interactions with the detector material, which may make the particles invisible to farther subdetectors. Results of this search on a data sample corresponding to a large fraction of the luminosity collected in 2011 are shown.

Primary author: GUIDO, Elisa (GE)**Presenter:** GUIDO, Elisa (GE)**Session Classification:** Modello Standard e oltre**Track Classification:** Fisica del Modello Standard e oltre