

ATLAS searches for vector-like quarks in the one-lepton channel and status of global search program

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Despite observations by the ATLAS and CMS experiments of a new particle consistent with the Standard Model Higgs boson, the mechanism of electroweak symmetry breaking remains undetermined. Further, the question of naturalness remains open. Supersymmetry provides elegant insights into these problems, but so far no evidence of such signals has been found. An alternative class of models are those in which electroweak symmetry is broken dynamically by a new strong interaction, such as in Topcolor, Little Higgs, and Composite Higgs models. A recurring feature of these models is the prediction of vector-like quarks, defined as quarks for which both chiralities have the same transformation properties under the electroweak gauge group. This talk focuses on two ATLAS searches in the single lepton channel with 8 TeV data, and also reviews these results in the context of the other ATLAS searches for vector-like quarks. Each of the four searches targets a particular vector-like quark decay mode, covering both charged and neutral current modes.

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Primary author: Dr COOKE, Mark (LBNL)

Co-authors: Ms SUCCURRO, Antonella (IFAE Barcelona); Prof. JUSTE, Aurelio (IFAE Barcelona); Dr HELSENS, Clement (CERN)

Presenter: Dr COOKE, Mark (LBNL)

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