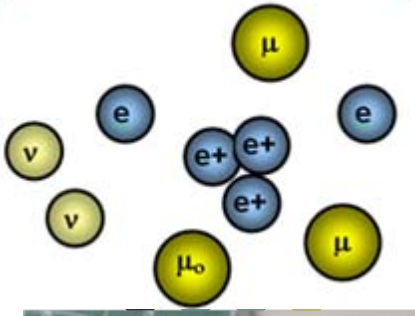
CU Physics Department Particle Seminar

Wednesday, April 27, 2011 705 Pupin Hall 1:00 PM

Leptoquarks: A Tale of Four Searches

Leptoquarks are hypothetical particles that carry both lepton and baryon number and are proposed to exist in several Grand Unification Theories (GUTs) and technicolor models. This work reports the search for pair production of scalar leptoquarks at the ATLAS detector using an integrated luminosity of 35 pb^{-1} collected from the 2010 data set. The leptoquarks decay into lepton/quark pairs giving an event topology of two high energy jets and either one high energy charged lepton and missing transverse energy or two high energy charged leptons. The background, predominantly from associated production of vector bosons with jets and top quarks, is estimated using Standard Model simulated data, normalized to observations in control regions. The number of events observed is in good agreement with these background predictions. First generation leptoquarks are excluded with a mass below 376 (319) GeV with β=1.0 (0.5) and second generation leptoquarks are excluded with a mass below 422 (362) GeV with $\beta=1.0 (0.5)$ at a 95\% confidence level.



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