Contribution ID: 114

Type: not specified

Constraints on models with universal extra dimensions from dilepton searches at the LHC

Thursday 23 May 2013 17:40 (15 minutes)

Models with universal extra dimensions predict that each Standard Model particle is accompanied by a tower of Kaluza-Klein resonances. Canonical searches for the production and cascade decays of first Kaluza-Klein modes through missing transverse momentum signatures suffer in general from low detection efficiencies because of the rather compressed Kaluza-Klein particle mass spectrum. We analyze signatures from the production of second Kaluza-Klein states which can decay into Standard Model particles and thus do not result in any missing transverse momentum. Such signatures provide a strong sensitivity, and are of particular interest as they would allow for a clear distinction between extra dimension models and other models of new physics like supersymmetry.

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Session Classification: Parallel Session on LHC and DM