

ICHEP2012



Contribution ID: 790

Type: **Poster Sessions**

Search for RS Gravitons decaying into a Jet plus Missing ET with CMS

Saturday, July 7, 2012 6:00PM (1 hour)

We search for the production of heavy resonances in proton-proton collisions at $\sqrt{s} = 7$ TeV, with the Randall-Sundrum graviton as a benchmark model. We focus on the G to ZZ to $q\bar{q}$ reaction with boosted Z bosons. We look for the jet plus missing transverse energy signature in the 4.7 fb^{-1} of data collected by the CMS detector during 2011. Since the event yield is compatible with what would be expected solely from Standard Model processes, we are able to derive limits on the cross-section for the RS graviton production, and hence on the parameters of the Warped Extra Dimensions model. The cross-section 95% confidence upper limits are found to be in the range $[0.047, 0.021]$ pb for resonance masses ranging between 1000 and 1500 GeV. We extend the k/MPI search range to values up to 0.3, and translate the cross-section limits to the $(m_G, k/\text{MPI})$ parameter space. In that way, we set 95% confidence upper limits on the coupling parameter k/MPI in the range 0.11 to 0.29, for the aforementioned resonance mass range.

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Session Classification: Poster Session

Track Classification: Track 3 - BSM - Non-SUSY Exotics