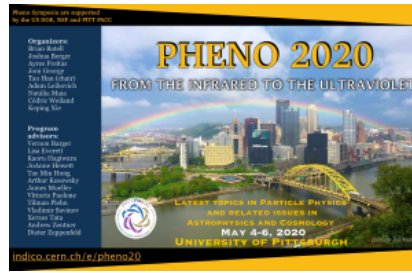


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Signals of KK graviton from extended warped extra dimensions at the LHC (I)

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We analyze signals arising from production and subsequent decay of Kaluza-Klein (KK) gravitons in the extended warped extra dimensional models at the LHC. In these models, the extra dimensional bulk is divided into two regions: (i) from the Planck/UV brane to an $O(10 \text{ TeV})$ middle brane, and (ii) from the middle brane to an $O(\text{TeV})$ IR brane. The standard model (SM) fermions and Higgs only propagate in region (i), while standard model gauge bosons and gravity propagate through all the bulk. This structure suppresses flavor violation, while keeping gravitons and KK gauge bosons light enough to be accessible at the LHC. We find that the signals from KK graviton are significantly different than in the standard warped model (with only the UV and IR branes). This is because the usually dominant decay modes of KK gravitons are suppressed, allowing other decay channels to shine. In particular, we analyze the following two channels for decays of KK graviton: (1) KK graviton decaying into a pair of radions and each radion decaying subsequently into a pair of jets, giving an overall 4-jet signal with “antler” topology (2) KK graviton decaying into a KK gluon and a (SM gluon) jet followed by the KK gluon decaying into a radion and a gluon jet, and finally the radion decaying into a pair of jets. This again results in a 4-jet signal, but this time with a different, “double-cascade” topology.

Summary

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