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

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The extended warped model predicts two 4-jet signals produced by KK graviton decay: (1) KK graviton decay to two radions, which each dominantly decay to two (SM gluon) jets, and (2) KK graviton decay to KK gluon and (SM gluon) jet, followed by KK gluon to radion and (SM gluon) jet, followed by radion to two jets. We analyze two parts of the model's parameter space at 14 TeV HL-LHC specifications. First, when the KK gluon is heavy, the decay of KK graviton to KK gluon and SM gluon is negligible. Analysis cuts focus on the “antler” topology of channel (1), imposing two dijet resonances and the 4-jet resonance on the final state jets. Second, when the KK gluon is lighter, the analysis cuts focus on the “double cascade” topology of channel (2), imposing a dijet resonance nested in a trijet resonance and the 4-jet resonance. For the second part of the analysis, we find the contribution from channel (1) can be important. Multiple benchmark points for each signal are shown with at least 3σ significance with an integrated luminosity 3000 fb^{-1} .

Summary

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