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Gravitational Fixed Points and Virtual-Graviton Signals at LHC

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LHC searches for extra-dimensional graviton signals suffer from a general problem: in addition to the fundamental Planck scale we have to introduce a cutoff (roughly of the order of the Planck scale) to compute collider effects. A slight misalignment between the Planck scale and this cutoff has huge effects for example on virtual-graviton observables. Starting completely generally from an ultraviolet fixed point as a minimal assumption on the theory of quantum gravity we show that the change in the anomalous dimension of the graviton propagator naturally regularizes LHC cross sections without any ad-hoc cutoff procedure. We quantify the effects of such a description on the rates and uncertainties for virtual-graviton signals at the LHC.

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