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Constraints on U(1)‘ solutions to the flavor anomalies with trans-Planckian asymptotic safety

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The Standard Model is a very successful theory. However, few of the observed phenomenon is at odds with the current fundamental theory. One such discrepancy is observed in the rare decays of B-meson decays which are referred as flavor anomalies. In this talk, I will discuss flavor-anomaly solutions with U(1)‘ extensions in the framework of asymptotically safe quantum gravity. The universal contribution of quantum gravity to renormalization group equations (RGEs) of all the gauge and the Yukawa couplings, beyond the Planck scale, ensues interdependent boundary conditions between the Standard Model and the New Physics (NP) couplings during the flow of RGEs from an interactive UV fixed point. As a result, precise measurements of low-energy SM couplings fix the exact values of the NP couplings, and accordingly, the NP mass range can be significantly narrowed down. We confront the models parameter space with the various LHC searches for VL fermions and the new gauge boson Z'. We find a viable parameter space with a potential to probe entirely in LHC Run 3.

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