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The odd kink behind small fermion masses

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The flavor puzzle remains one of the outstanding questions in particle physics. Several mechanisms predicting large hierarchies among the different fermion masses with anarchic parameters exist on the market. Among them, models with warped extra dimensions stand out since they also address the quadratic sensitivity of the Higgs mass. However, up to now, fermion bulk masses controlling the localization of the different chiral modes – and therefore the different fermion masses – were ad-hoc parameters of the theory. In this talk, I will show the feasibility of dynamically generating fermion bulk masses with a bulk scalar in warped extra dimensions. As I will show, the bulk scalar acquires a kink background solution, odd under the orbifold symmetry, which gives rise to the fermion bulk masses through Yukawa-like interactions. I will discuss the phenomenological implications of the backreaction on the metric and the modified fermion profiles due to the bulk scalar field on electroweak precision and flavor observables.

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