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Renormalization of fermion flavour mixing

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Please give a brief summary of your poster

We present an explicit on-shell framework to renormalize the fermion flavour mixing matrices in the Standard Model (SM) and its extensions, at one-loop level. It is based on a novel procedure to separate the external-leg mixing corrections into gauge-parameter-independent self-mass and gauge-parameter-dependent wave-function renormalization contributions. An important property is that this formulation complies with ultra-violet finiteness and gauge parameter independence, and also preserves the basic structure of the theory. On the basis of the above renormalization scheme we then study the implications of quark mixing renormalization effects on the determination of the Cabibbo-Kobayashi-Maskawa (CKM) parameters. We find that, the inclusion of these effects does not alter the most precise unitarity test of the CKM matrix and that it remains an impressive test of the SM at the level of its quatntum corrections. In fact, it is worth remembering that the electroweak corrections in this test amount to roughly 4%. Thus, if they were neglected, the unitarity test of the CKM matrix would fail by about 66 standard deviations!

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