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Lattice input on the tau V_us puzzle

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Existing versions of the standard determinations of V_us from flavor-breaking finite energy sum rules with hadronic tau decay data as input yield V_us values 3 sigma or more below the expectations of 3-family unitarity. Slow convergence of the D=2 OPE series employed in these sum rules, however, makes it hard to assess the reliability of the use of the OPE representation. In this paper we use Euclidean Q^2 lattice data for the relevant flavor-breaking polarization function difference to assess the use and reliability of the OPE for this quantity. We then revisit the sum rule determination of V_us with the lessons learned from this study in mind. We show that previously encountered self-consistency problems are solved by the new analysis, and note that, with the the strange spectral distribution modified to account for the somewhat larger preliminary BaBar result for the K^- pi^0 branching fraction, the resulting output V_us is in good agreement with the result obtained from K_{ell 3} using lattice input for f_+(0).

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