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Vus from inclusive strange tau decay data and lattice HVP

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We present a novel approach to determining Vus which employs inclusive strange hadronic tau decay data and hadronic vacuum polarization functions (HVPs) computed on the lattice. The experimental and lattice data are related through dispersion relations which employ a class of weight functions which are products of factors having poles at Euclidean Q^2.

Implementing this approach using lattice data generated by the RBC/UKQCD collaboration, we show examples of weight functions which allow the combination of lattice HVPs required for this analysis to be determined with good accuracy while at the same time strongly suppressing spectral integral contributions from the region where experimental data either have large uncertainties or do not exist.

Preliminary results for Vus obtained using this approach will be presented and shown to be in good agreement with those obtained from analyses of kaon physics and 3-family CKM unitarity.

Related background, details of the experimental data employed and the current status of the conventional flavor-breaking sum rule tau V_us puzzle, as well as an outline of the advantages of the new approach over the conventional sum rule analysis will be discussed in the talk by Kim Maltman. Some related studies, involving applications to the running of alpha_QED and the Weinberg angle, and a possible application to muon g-2 will also be discussed, as time permits.

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