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## **V<sub>us</sub> from inclusive determinations based on hadronic tau data**

*Thursday, July 28, 2016 3:20 PM (20 minutes)*

We discuss the current status of the determination of  $V_{us}$  based on flavor-breaking finite energy sum rule analyses of non-strange and strange hadronic tau decay data, highlighting the role of lattice input in providing a means of investigating the reliability of the OPE representation for the relevant flavor-breaking polarization combination employed in this analysis, and in quantifying the associated theoretical errors on  $V_{us}$ . We present results for  $V_{us}$  based on a new implementation of this approach motivated by continuum and lattice studies and show that this resolves the long-standing problem of  $V_{us}$  values more than 3 sigma low compared to 3-family unitarity expectations obtained in earlier implementations of this approach. We also discuss the practical limitations of this new implementation given what near-term improvements are likely in the experimental strange decay distributions, and, motivated by these limitations, propose a new method for obtaining  $V_{us}$  which involves dispersive analyses of the strange hadronic tau decay data alone in which lattice results for the relevant combination of the flavor  $us$   $J=0$  and 1 vector and axial vector polarizations can be used in place of the OPE. Details of the practical implementation of this approach, as well as preliminary results for  $V_{us}$ , will be presented in the accompanying talk by Hiroshi Ohki.

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