

Determination of f_K/f_π from 2+1+1 flavor 4-stout staggered lattices

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Motivation

- Pion and Kaon decays widths

$$\Gamma(\pi \rightarrow l\nu_l) = \frac{G_F^2}{8\pi} m_l^2 M_\pi (1 - m_l^2/M_\pi^2)^2 \times |V_{ud}|^2 \times f_\pi^2 (1 + \delta_\pi)$$

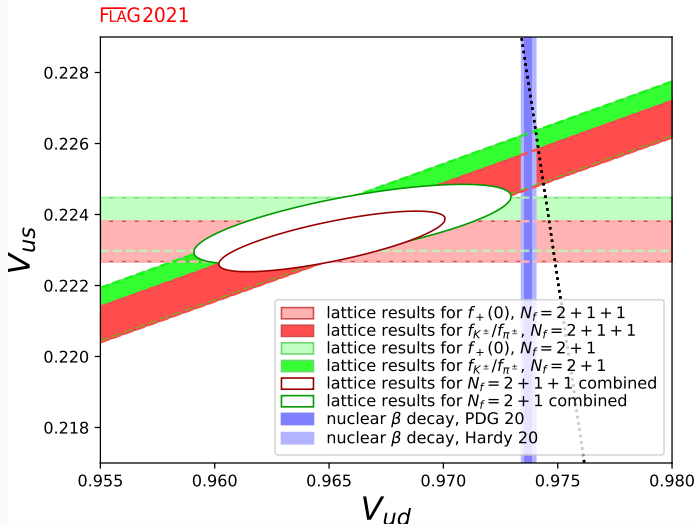
$$\Gamma(K \rightarrow l\nu_l) = \frac{G_F^2}{8\pi} m_l^2 M_K (1 - m_l^2/M_K^2)^2 \times |V_{us}|^2 \times f_K^2 (1 + \delta_K)$$

- CKM unitarity condition:

$$|V_{ud}|^2 + |V_{us}|^2 \approx |V_{ud}|^2 + |V_{us}|^2 + |V_{ub}|^2 = 1$$

- $2 - 3\sigma$ tension between experiments and standard model predictions

FLAG 21



CKM constraints (FLAG21)

This work

- Detailed analysis of f_K/f_π
- 28 different lattices and 7 lattice spacing with 4-stout staggered fermions
- Correlation functions, plateau fits, finite volume effects, strong isospin breaking effects, global fits, treating of systematic and statistical errors, blinding ...
- Our values are still blinded
- Error is small compared to most of the other lattice results