Contribution ID: **155** Type: **Talk**

Improving our determinations of the decay constant f_B and the $B \to \pi\ell\nu$ semi-leptonic form factors using physical light quarks

Friday, 17 July 2015 16:30 (20 minutes)

We report on updates of our B-physics program using domain-wall light quarks and nonperturbatively tuned, relativistic b-quarks by adding measurements obtained with dynamical and physical light quarks. We present progress towards improved determinations of the B-meson decay constant f_B, the ratio f_{B_s}/f_B, and the $B \to \pi\ell\nu$ semi-leptonic form factor. Our results are based on the RBC/UKQCD 2+1 flavor gauge field configurations with (M\"obius) domain-wall fermions and the Iwasaki gauge action at two lattice spacing of 0.086 fm and 0.11 fm.

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Session Classification: Weak Decays and Matrix Elements

Track Classification: Weak Decays and Matrix Elements