Contribution ID: **13** Type: **not specified**

Perturbative calculation of Z_q at the one-loop level using HYP-smeared staggered quarks

Tuesday, 24 July 2018 18:45 (2 hours)

We present matching factors for Z_q calculated perturbatively at the one-loop level with improved staggered quarks. We calculate Z_q with HYP-smeared staggered quarks and Symanzik-improved gluons in RI- and RI′-MOM scheme. Using the conversion factor, we also present Z_q in MSbar scheme. As a byproduct, we present the quark mass renormalization factor Z_m in MSbar scheme. We compare the result from this work with those of nonperturbative renormalization method.

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Session Classification: Poster reception

Track Classification: Standard Model Parameters and Renormalization