

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

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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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