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Non-perturbative Renormalization of Four-fermion Operators Relevant to B_K with Staggered Quarks.

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We present matching factors for the four-fermion operators obtained using the non-perturbative renormalization method (NPR) in RI-MOM scheme for improved staggered fermions on the MILC asqtad lattice ($N_f = 2+1$).

Using $20^3 * 64$ lattice ($a = 0.12$ fm, $a_m_1/a_m_s = 0.01/0.05$), we obtain the matching factor of B_K operator. Also we are in the middle of data analysis on the BSM operators.

These results will be used to obtain B_K and the BSM B -parameters.

We expect that the matching factor error obtained using NPR is in the level of $\sim 2\%$ which is much smaller than that of the one-loop perturbative matching ($\sim 4.4\%$).

We compare NPR results with those of one-loop perturbative matching.

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