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RG running and mixing for $\Delta F = 2$ Four-Fermion Operators from Step-Scaling Matrices in χ SF schemes

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We show preliminary results for the nonperturbative Renormalization Group (RG) running of the full $\Delta F = 2$ four-fermion operators basis in QCD with $N_f = 3$ massless dynamical flavours. The perturbative part of the running is obtained extending the conventional approaches in the literature, employing the Poincaré–Dulac theorem. The nonperturbative computations employ $\mathcal{O}(a)$ -improved Wilson fermions in a mixed action framework: chirally rotated Schrödinger functional (χ SF) boundary conditions for valence quarks and standard Schrödinger Functional (SF) boundaries for the sea quarks. The RG evolution operators are determined through matrix step-scaling functions (SSF), using a SF coupling in the perturbative regime down to $\sim 4\text{GeV}$, and a Gradient Flow (GF) coupling from $\sim 4\text{GeV}$ down to $\sim 200\text{ MeV}$. Moreover, the results have been obtained in two different normalization schemes and validated through a variety of consistency checks.

Parallel Session (for talks only)

Standard Model parameters

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