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Testing universality and automatic O(a) improvement in massless lattice QCD with Wilson quarks

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The chirally rotated Schroedinger functional provides a test bed for universality and automatic O(a) improvement. In joint work with Bjoern Leder, we have implemented the chirally rotated Schroedinger functional and carried out extensive quenched simulations. We demonstrate that, after proper tuning of a dimension 3 boundary counterterm, the expected chirally rotated boundary conditions are indeed obtained. As a result, automatic O(a) improvement is realised and we demonstrate this with a few examples. Universality of properly renormalized correlation functions is confirmed by comparing to results obtained with the standard set-up of the Schroedinger functional. As a by-product of this study the non-singlet current renormalisation constants Z_A and Z_V are obtained from ratios of 2-point functions.

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