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Stabilised Wilson fermions for QCD on very large lattices

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Rough gauge fields are an obstacle in large-scale dynamical fermion simulations with Wilson quarks when the pion mass is lowered and the gap of the lattice Dirac operator shrinks. In this talk, a reformulation of the O(a) improved Wilson-Dirac operator is given which is largely protected from numerical instabilities during the molecular dynamics evolution. First results are very promising as physical-point simulations in three-flavour QCD at lattice spacings as large as 0.095 fm become feasible. The implementation comes without additional cost and is a crucial ingredient towards master-field simulations with fermions.

Authors: FRITZSCH, Patrick (CERN); FRANCIS, Anthony Sebastian (CERN); LÜSCHER, Martin (CERN); RAGO, Antonio (University of Plymouth (GB))

Presenter: FRITZSCH, Patrick (CERN)

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