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A5: Two-grid overlap solver in lattice QCD

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In lattice quantum chromodynamics with chiral fermions we want to solve linear systems which are chiral and dense discretizations of the Dirac operator, or the overlap operator. For this purpose, we use the equivalence of the overlap operator with the truncated overlap operator, which is a five dimensional formulation of the same theory. The coarsening is performed along the fifth dimension only. We have tested first this algorithm for small lattice volume 8^4 and we bring here our results for larger lattice size 16^4. We have done simulation in the range of coupling constants and quark masses for which the algorithm is fast and saves a factor of 6, even for dense lattice, compared to the standard Krylov subspace methods.

Author: Dr XHAKO, Dafina (Polytechnic University of Tirana)

Co-authors: Dr OSMANAJ, Rudina (Faculty of Natural Sciences, University of Tirana); Dr HYKA, Niko (Department of Diagnostics, Faculty of Medical Technical Sciences, Medical University of Tirana)

Presenter: Dr XHAKO, Dafina (Polytechnic University of Tirana)

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