

ILDG Algorithm Glossary for mtHHMC: HMC algorithm with multiple time scale integration and mass preconditioning

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Abstract

We describe the parameters for the HMC algorithm with multiple time scale integration and mass preconditioning (Hasenbusch accelerated) (mtHHMC) needed to set up XML configuration and ensemble files for ILDG.

The accelerated version of the HMC algorithm [1] is described in detail in Ref. [2]. We refer to this reference for all the unexplained notation.

Parameter	XML Tag	Comment
Integrator	<integrationScheme>	
τ	<trajectoryLength>	
Solver	<solver>	CG or BiCGstab
N_{PF}	<nrPseudoFermionFields>	1 to 3
$2\kappa\mu_1$	<twoKappaMu2>	
$2\kappa\mu_2$	<twoKappaMu3>	
N_0	<integrationStepsGauge>	
$N_{N_{\text{PF}}}$	<integrationStepsMu>	
N_i	<integrationStepsMuX>	X must be replaced with $N_{\text{PF}} - i$
rel. precision	<relativePrecision>	true or false
$\tilde{\epsilon}^2$	<acceptancePrecisionMu>	
$\tilde{\epsilon}^2$	<acceptancePrecisionMu2>	
$\tilde{\epsilon}^2$	<acceptancePrecisionMu3>	
$\epsilon_{N_{\text{PF}}}^2$	<forcePrecisionMu>	
ϵ_i^2	<forcePrecisionMuX>	X must be replaced with $N_{\text{PF}} - i$
CSG	<chronologicalSolverGuess>	true or false
	<cSGHistoryMu>	
	<cSGHistoryMu2>	
	<cSGHistoryMu3>	
	<nSkip>	Nr. traj. to skip until next save

Table 1: XXX

References

- [1] S. Duane, A. D. Kennedy, B. J. Pendleton and D. Roweth, Phys. Lett. **B195**, 216 (1987).
- [2] C. Urbach, K. Jansen, A. Shindler and U. Wenger, Comput. Phys. Commun. **174/2**, 87 (2005), [hep-lat/0506011].