



# Grid Activity for Lattice QCD Research

## Lattice QCD Archive



### About the Archive

This Archive stores gauge configurations and other data of lattice QCD, and makes them available to lattice field theory community world-wide.

### Files stored

The main set of files currently in the Archive are the two-flavor full QCD configurations generated by the CP-PACS parallel computer at the Center for Computational Physics. There are four sets of files corresponding to four lattice spacings, all generated with the renormalization-group improved Iwasaki gluon action and the Wilson-clover quark action with tadpole-improved cover coefficient.

**LATTICE QCD ARCHIVE**  
Center for Computational Sciences, University of Tsukuba

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### Two-flavor full QCD configurations by CP-PACS

The two-flavor full QCD configurations in this archive are generated by the CP-PACS Collaboration on the CP-PACS parallel computer at the Center for Computational Sciences, University of Tsukuba.

When you download / use the files in this archive, please note the [conditions](#) given in the top page.

#### Simulation parameters

These gauge configurations are generated with a renormalization-group improved gauge action and a mean field improved clover quark action at three values of  $\beta = 6/g^2$ , corresponding to lattice spacings of  $a$  (approx 0.22, 0.16 and 0.11 fm), and four sea quark masses corresponding to  $m_{\text{PS}}/m_l$  (approx 0.8, 0.75, 0.7 and 0.6). The sizes of lattice are chosen to be  $12^3 \times 24$ ,  $16^3 \times 32$  and  $24^3 \times 48$  so that the physical spatial size is kept constant at  $L_a$  (approx 2.5 fm). The scale  $a$  is fixed by  $M_{\text{Pl}} = 768.4$  MeV.

beta	lattice	$c_{\text{SW}}$	$a$ [fm]	$L_a$ [fm]	$m_{\text{PS}}/m_l$ for sea quarks #traj (thermalized)			
1.80	$12^3 \times 24$	1.60	0.2150(22)	2.580(26)	0.807(1) 6250	0.753(1) 5000	0.694(2) 7000	0.547(4) 5250
					0.804(1)	0.752(1)	0.690(1)	0.582(3)



### International Lattice Data Grid

- An international collaboration to share Lattice QCD configurations generated at several sites.
- To develop an international datagrid for the lattice field theory community.
- Design of QCD configuration markup language (QCDml 1.1) was completed in June 2004.
- Developing middleware for ILDG is in progress.
- <http://www.lqcd.org/ildg>

### International Lattice Data Grid

This Archive forms one of the sites of the International Lattice Data Grid (ILDG). It will serve as a gateway to the other sites of ILDG in Europe and USA. The query system of the Archive is designed to eventually allow world-wide search and retrieval of configurations stored in ILDG.

- Web GUI interface for meta-database:  
<http://www.lqa.ccs.tsukuba.ac.jp/>

## HEPnet-J/sc - Japanese National Lattice QCD network -

- HEPnet-J/sc is a network of NAS storages and supercomputers for lattice QCD using SuperSINET, which is a 10 Gbps network backbone connecting major universities and research institutions in Japan.

Since winter 2002, mirroring of gauge configurations generated by SR8000 (1.2 TFlops) at KEK and by CP-PACS (0.6 TFlops) and VPP5000 (0.77 TFlops) at University of Tsukuba has been operational. Mirroring was expanded to six sites in spring 2004.

