ILDG Activity II

External Review on CCS, 2007/10/31

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Computational Particle Physics Group, CCS

1. Metadata Working Group
2. Lattice QCD Archive

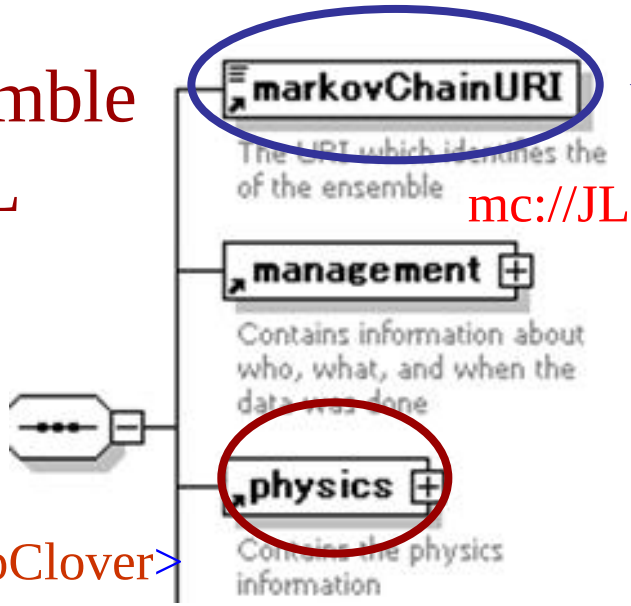
convener of the working group
responsible for archival and maintenance
of physics data in the Archive

Metadata Working Group

- objectives
  - give standards of notation and terminology to describe metadata of ensembles/configurations
  - develop QCDml: an XML-based markup language
- members
  - G.Andronico (INFN), P.Coddington (Adelaide), C.DeTar (Utah), R.Edwards, B.Joo (JLAB),C.Maynard (Edinburgh) , D.Pleiter (DESY), J.Simone (FNAL), T.Yoshie (Tsukuba, convener)
- chronology
  - 2003/01: WG organized
  - 2003/07: draft version and public comments
  - 2004/05: first working version
  - frequent updates to meet community requirements

QCDml: data and metadata cooperation

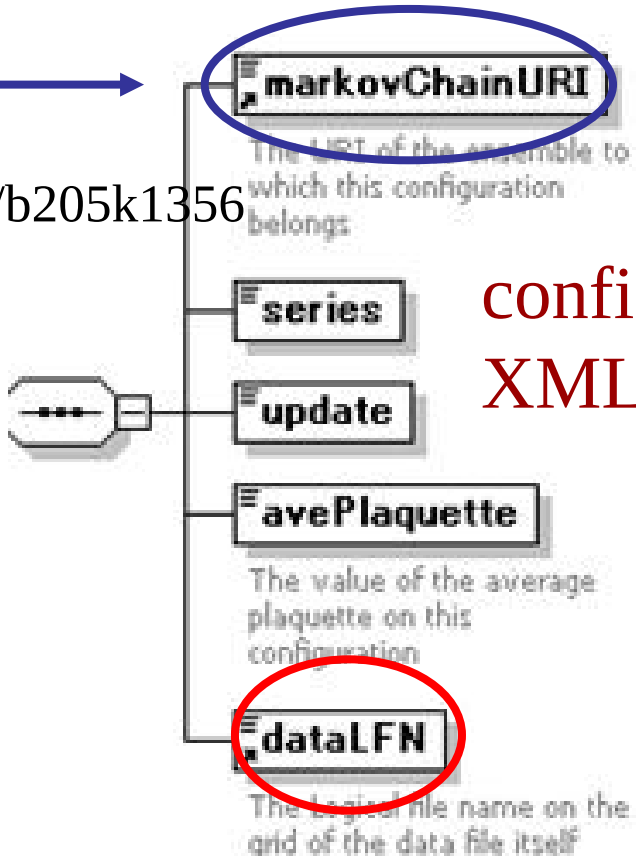
ensemble XML




```
<npClover>
  <kappa>0.1354</kappa>
  <cSW> 1.684 </cSW>
</npClover>
```

mc://JLDG/nf2/b205k1356

configuration XML



lfn://JLDG/nf2/b205k1356-A200

configuration file

file-format XML size, precision
configuration binary data ILDG Standard format
lfn://JLDG/nf2/b205k1356-A200

packed with LIME

- Contribution from CCS, Tsukuba
  - coordinate discussions as the convener of the WG
  - maintain mail list and WG official web page
  - presentations at bi-annual ILDG WS
    - 4 times of 7 talks (since 2004/05, ILDG04)
  - presentations and writeups at lattice conferences
    - 2 authorships of 4 contributions

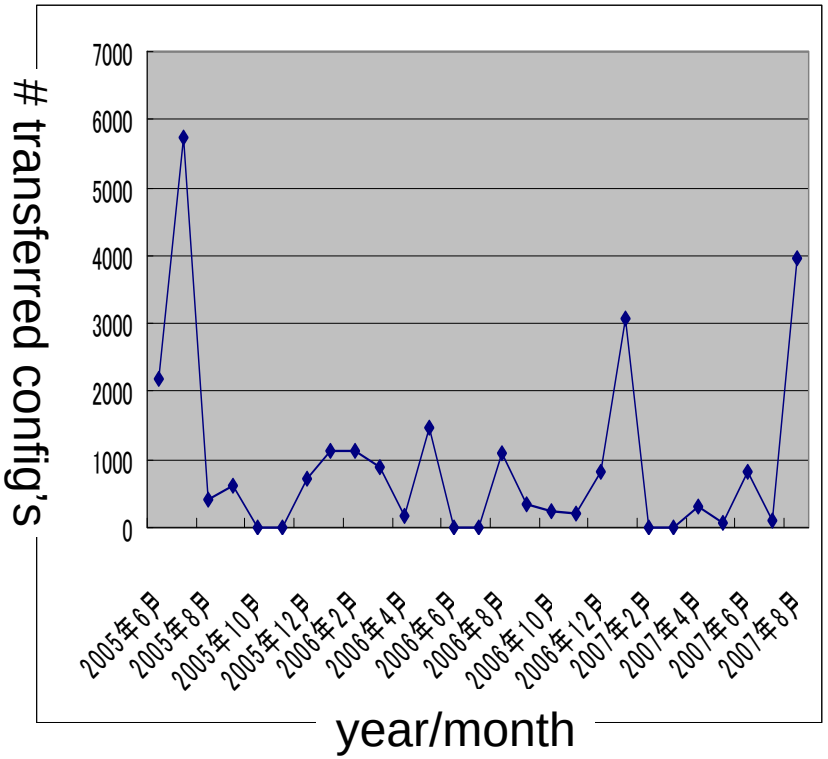
- Publications (which include contribution from the WG)

1) Progress in building an International Lattice Data Grid
   Nucl. Phys. (Proc.Suppl.) 129 (2004) 159. Lattice2003
2) QCDml: First milestone for building an International Lattice Data Grid
   Nucl. Phys. (Proc. Suppl.) 140 (2005) 213 , Lattice2004
3) Progress in building the International Lattice Data Grid
   PoS(LAT2006)028, Lattice2006
4) Marking up lattice QCD configurations and ensembles
   PoS(LATTICE2007)048, Lattice2007

Lattice QCD Archive (LQA)

- developed as the ILDG Japan site in 2003
- reconfigured in 2006 to make it compatible with the ILDG interface

- ensembles/configurations
  - CP-PACS Nf=2
    - since 2003
    - 3 a x 4 m_{ud}
    - 8000 config's, 1.5 TB
  - CP-PACS/JLQCD Nf=2+1
    - since 2007
    - 3 a x 10 (m_{ud},m_s)
    - 21000 config's, 6.0TB
- contribution of LQA to the community is high
  - widely interested and used



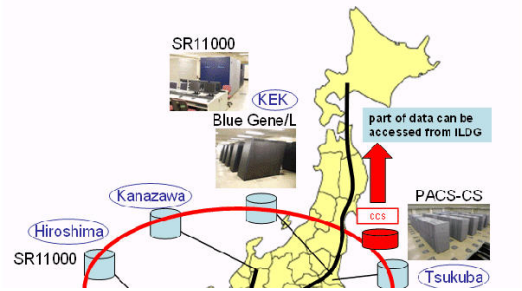
~950 config's per month
(1-2 ensembles/month)

JLDG top
http://www.jldg.org/

- Lattice QCD Archive, Japan
- JLDG Web Services

JLDG: Japan Lattice Data Grid

JLDG is a data-grid infrastructure for Lattice QCD (LQCD) community in Japan. Several large LQCD collaborations in Japan have been working on QCD simulations using super-computers. Outputs of simulations called "QCD configurations" are valuable, because physicists can study various aspects of QCD using these configurations. JLDG enables the community to share configurations distributed over distant sites. File sharing is realized with GFarm global file system. GSI authentication is managed by VOMS. JLDG utilizes the HEPnet-J/sc private network as a hardware infrastructure. Part of configurations can be accessed from all over the world through the ILDG interface.



interactive search

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About the archive

This Archive stores gauge configurations and other data of lattice QCD, and make them available to lattice field theory community world-wide. The Archive is maintained by the Center for Computational Sciences, Univ. of Tsukuba, as a part of Japan Lattice Data Grid (JLDG).

Files stored

We have two sets of files in the Archive.

- Two-flavor full QCD configurations contributed by the CP-PACS Collaboration. There are three sets of files corresponding to three lattice spacings, all generated with the renormalization-group improved Iwasaki gluon action and the Wilson-clover quark action with tadpole-improved cover coefficient.
  Details of the 2-flavor configurations are given here.
- 2+1 flavor full QCD configurations by the CP-PACS+JLQCD Collaborations. They were generated at three lattice spacings with a fully O(a) improved action -- combining the renormalization-group improved Iwasaki gluon action and a non-perturbatively O(a) improved Wilson-clover quark action -- and adopting an exact HMC+PHMC algorithm.
  Details of the 2+1 flavor configurations are given here.

Archived configurations are formatted with the ILDG standard. Ensemble XML files and configuration XML files are based on QCDmlEnsemble1.4.1 and QCDmlConfig1.3.0, respectively. Follow this link to search ensembles/configurations and to download configurations.

Conditions

Back to LQA Home

Actions
- About Achive
- Ensemble
- Ensemble Search
- Raw Search
- Current Data List

Lattice QCD Ex

- Number of Selected

Click "List Configuration" button to see the

List Configuration

Collaboration
ANY CP-PACS CP-PACS+JLQCD

Project
ANY
RCNF2 (Nf=2 full QCD with iwasaki RG gauge and tadpole
RCNF2+1 (Nf=2+1 full QCD with iwasaki RG gauge and non

Gluon Action
- iwasaki_RG_actiction (single choice)

'iwasaki_RG_action' beta Parameter
ANY 1.800 1.8300000000 1.9000000000 1.950

'iwasaki_RG_action' c0 Parameter
- 3.648 (single choice)

'iwasaki_RG_action' c1 Parameter
- -0.331 (single choice)

Quark Action
Total number of dynamical quarks

detailed description

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2+1 flavor full QCD configurations by CP-PACS+JLQCD

The 2+1 flavor full QCD configurations listed below are generated by the CP-PACS and JLQCD Collaborations on various supercomputers including

- the CP-PACS parallel computer (2048 nodes, peak 614 GFLOPS) and its frontend computer Hitachi SR-8000/G1 (12 nodes, peak 173 GFLOPS) at the Center for Computational Sciences, University of Tsukuba,
- Hitachi SR-8000/F1 (100 nodes, peak 1.2 TFLOPS) at High Energy Accelerator Research Organization (KEK)
- Fujitsu VPP-5000 (80 nodes, peak 768 GFLOPS) at Academic Computing and Communucations Center, University of Tsukuba and
- the Earth Simulator (640 nodes, peak 40 TFLOPS) at Japan Agency for Marine-Earth Science and Technology (JAMSTEC)

Access policy

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 non-perturbatively O(a) improved clover quark action at three values of beta = $6/g^2$, corresponding to lattice spacings of a ¥approx 0.12, 0.10 and 0.07 fm (a^2 ¥approx

A.Ukawa, T.Yoshie, N.Ishii
M.Sato, T.Boku, O.Tatebe
with members of 5 distant sites in Japan for JLDG

budget: JSPS (ILFTnet), NII (CSI,VO)