

Site Report on Physics Plans and ILDG Usage for US

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Machines used for LQCD in US

- **DOE Facilities**
 - Intrepid (BlueGene/P) @ ANL
 - Jaguar (Cray XT4) @ ORNL
 - Jaguar PF (Cray XT5) @ ORNL
 - Franklin (Cray XT4) @ NERSC
- **NSF Facilities**
 - Kraken (Cray XT5) @ ORNL
 - BigBen (Cray XT3) @ PSC
 - Ranger (Opteron Infiniband Cluster) @ TACC
- **Miscellaneous**
 - UBGL (BlueGene/L @ LLNL)
 - New York Blue (BlueGene/L @ BNL)
- **USQCD Facilities**
 - QCDOC at BNL
 - Clusters at FNAL and JLab (jpsi, 7n: Opteron + IB) primarily for analysis

Anisotropic Clover

- Primary Purpose:
 - Spectroscopy: Excited States, Resonances, Spin/Parity Identification, Photocouplings
 - Multi Particle States: Decays
- Requirements:
 - Fine temporal extent (control over excited states)
 - Long temporal extent
 - control contamination from backward propagating states
 - control signal-to-noise ratio
 - Large volume
 - High Statistics
- Most active current consumers: Hadron Spectrum & NPLQCD collaborations

Anisotropic Clover: Status

Lattices have $a_s = 0.1227\text{fm}$, $a_t^{-1} \sim 5.6 \text{ GeV}$, $\xi \sim 3.5$

V	m_l	m_s	m_π (MeV)	#traj	status
$16^3 \times 128$	-0.0840	-0.0743	383	11005	done
$20^3 \times 128$	-0.0840	-0.0743	383	13090	done
$24^3 \times 128$	-0.0840	-0.0743	383	12985	done
$32^3 \times 256$	-0.0840	-0.0743	383	~980	ongoing
$24^3 \times 128$	-0.0860	-0.0743	230	5500	ongoing
$32^3 \times 256$	-0.0860	-0.0743	230	~550	ongoing

Comments:

- m_s tuned to physical strange quark mass: PRD. 79:034502,2009
- larger lattices need double precision: slow going
- run with physical m_π planned if resources become available

Staggered AsqTAD Production

- Table from Carleton De Tar
- Carleton comments: “AsqTAD production is winding down. MILC is in the process of completing its AsqTAD contribution to ILDG”

m_{ud}	m'_s	size	a	time units
0.1 m_s	0.1 m_s	40 ³ x96	0.09 fm	3000 (P)
0.15 m_s	m_s	56 ³ x144	0.06 fm	5000
0.2 m_s	0.6 m_s	64 ³ x144	0.06 fm	2500
0.3 m_s	m_s	48 ³ x144	0.06 fm	3500
0.2 m_s	m_s	64 ³ x192	0.045 fm	5000

(P) = in production

Staggered HISQ Production

MILC 2+1+1 Flavour HISQ Lattices (table courtesy of Carleton DeTar)

m_{ud}/m_s	size	a	time units
0.2	$24^3 \times 64$	0.12 fm	3000 (P)
0.2	$32^3 \times 96$	0.09	3000 (P)
0.2	$48^3 \times 144$	0.06	3000 (T)
0.1	$32^3 \times 64$	0.12	3000 (T)
0.1	$40^3 \times 96$	0.09	3000 (T)
0.1	$64^3 \times 144$	0.06	3000 (?)

(P) In production

(T) Tuning

(?) Planned

DWF Generation

- Didn't receive contribution from RBC,
 - hopefully UK report includes status as part of RBC-UKQCD-LHPC collaboration
 - Many QCDOC generated configurations available independently of ILDG
 - <http://lattices.qcdoc.bnl.gov>
 - See the web site for access policies

US ILDG Contributions

- MILC Continually converting configs and adding them to the Storage Element (SE) at FNAL.
 - Open access policy: Freely available to ILDG
 - Mark Up proceeds as Carleton's time allows
 - Published in MDC when Balint receives it & has time
 - Sometimes there are configs on SE, but not in MDC/FC
 - Can still get them with GridFTP if location is known
- Hadron Spectrum collaboration archives configs at JLab.
 - Anisotropic Clover is available to USQCD, but not freely available worldwide yet.
 - Previous Anisotropic Wilson has been added to ILDG
 - Publication policy is not stationary.
 - Currently “1 year after first publication” ?

Other sources of US Configurations

- Gauge Connection
 - is getting revamped
 - for more information, see report by Jim Simone later on.