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# Lattice QCD Thermodynamics First 5000 Trajectories

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March 27, 2007

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This work was performed under the auspices of the U.S. Department of Energy by University of California, Lawrence Livermore National Laboratory under Contract W-7405-Eng-48.

# Lattice QCD Thermodynamics

## First 5000 Trajectories

### Background

These results represent the first LQCD analysis for approximately 5000 trajectories with each of the p4rhmc and milc codes, with some of the lower temperature runs having fewer. Both runs were for lattice dimensions of  $32^3 \times 8$ . Some  $32^4$  T=0 jobs were also run for p4rhmc. The p4 calculation was performed with v2.0 QMP\_MPI.X (semi-optimized p4 code using qmp over mpi) and milc version of the su3\_rhmc\_susc\_eos executable dated Mar 1, 2007 on ubgl in the /usr/gapps/hip/qcd/milc/bin subdirectory (svn revision 28). As with previous runs, calculations were performed along lines of constant physics, with the light quark masses 2-3 times their physics values and the strange quark mass set by  $m_{ud} = 0.1m_s$ .

Job submissions were performed using a new subSet.pl job submission script that locates current jobs and submits additional jobs with the same beta value as pending. Note that after reaching a limit of about 35 jobs subsequent submissions are delayed and will not be submitted directly from that state. The job submission script was used to submit revised versions of the milc and p4rhmc csh scripts. Initial thermalized lattices for each code were also for milc (taken from the firstPhys runs), but the p4rhmc runs include thermalization. The only modifications for running on BG/L were to the directory names and the mT parameter which determines job durations (24 hrs on BG/L vs. 4 hrs on ubgl). All finite temperature jobs were submitted to the 512 node partitions, and all T=0 runs were submitted to 2048 node partitions.

The set of runs was plagued by filesystem errors on lscratch1 and lscratch2. Many jobs had to be reset (deleting the most recent output file for milc and/or lattice for p4) and resubmitted. The analysis was performed with a new set of scripts that produced a more condensed output for scanning. All scans were verified with checksums, which have been retained in the output along with the line numbers. All lattices, log files, and job submission scripts have been archived to permanent storage in the 5k subdirectory for subsequent analysis.

## MILC Results

```

1: 2912: beta ns nt mud ms u0 dt accept N
2: 2432:6.4580 32 8 0.00820 0.0820 0.8549 0.01430 0.77 1775
3: 2444:6.5000 32 8 0.00765 0.0765 0.8569 0.01430 0.79 3975
4: 2428:6.5500 32 8 0.00705 0.0705 0.8594 0.01430 0.79 4355
5: 2408:6.6000 32 8 0.00650 0.0650 0.8616 0.01430 0.80 4345
6: 2441:6.6500 32 8 0.00599 0.0599 0.8636 0.01430 0.81 4355
7: 2423:6.7000 32 8 0.00552 0.0552 0.8657 0.01250 0.84 1981
8: 2407:6.7600 32 8 0.00500 0.0500 0.8678 0.01250 0.85 4021
9: 2423:6.8000 32 8 0.00471 0.0471 0.8692 0.01250 0.87 4039
10: 2438:6.8500 32 8 0.00437 0.0437 0.8709 0.01250 0.87 3785
11: 2428:6.9000 32 8 0.00407 0.0407 0.8726 0.01250 0.87 3849
12: 2419:6.9500 32 8 0.00380 0.0380 0.8741 0.01250 0.88 4350
13: 2424:7.0000 32 8 0.00355 0.0355 0.8756 0.01250 0.89 4546
14: 2413:7.0800 32 8 0.00310 0.0310 0.8779 0.01250 0.89 4126
15: 4679: beta ns nt ReP dReP chi_L dchi_L cgiters dcgitters N
16: 2318:6.4580 32 8 0.0023 0.0001 0.057 0.002 0.0 0.0 1775
17: 2306:6.5000 32 8 0.0033 0.0001 0.061 0.002 0.0 0.0 3975
18: 2311:6.5500 32 8 0.0049 0.0001 0.061 0.002 0.0 0.0 4355
19: 2317:6.6000 32 8 0.0079 0.0001 0.069 0.002 0.0 0.0 4345
20: 2309:6.6500 32 8 0.0123 0.0002 0.072 0.003 0.0 0.0 4355
21: 2327:6.7000 32 8 0.0189 0.0003 0.078 0.004 0.0 0.0 1981
22: 2315:6.7600 32 8 0.0273 0.0004 0.086 0.004 0.0 0.0 4021
23: 2317:6.8000 32 8 0.0337 0.0003 0.093 0.004 0.0 0.0 4039
24: 2338:6.8500 32 8 0.0399 0.0003 0.086 0.003 0.0 0.0 3785
25: 2336:6.9000 32 8 0.0467 0.0003 0.089 0.005 0.0 0.0 3849
26: 2315:6.9500 32 8 0.0531 0.0003 0.094 0.003 0.0 0.0 4350
27: 2319:7.0000 32 8 0.0588 0.0003 0.092 0.003 0.0 0.0 4546
28: 2304:7.0800 32 8 0.0701 0.0004 0.104 0.004 0.0 0.0 4126
29: 4881: beta ns nt pbp_ud dpbp_udpbp_s dpbp_s plaq dplaq N
30: 3364:6.4580 32 8 0.079364 0.000140 0.193556 0.000089 1.602620 0.000054 1775
31: 3343:6.5000 32 8 0.066863 0.000110 0.175463 0.000071 1.618220 0.000044 3975
32: 3329:6.5500 32 8 0.053600 0.000120 0.155673 0.000070 1.636270 0.000041 4355
33: 3334:6.6000 32 8 0.042059 0.000120 0.137892 0.000070 1.653130 0.000039 4345
34: 3319:6.6500 32 8 0.031174 0.000210 0.121460 0.000110 1.669110 0.000038 4355
35: 3318:6.7000 32 8 0.020816 0.000240 0.106203 0.000120 1.684630 0.000041 1981
36: 3316:6.7600 32 8 0.013420 0.000180 0.090604 0.000140 1.701890 0.000051 4021
37: 3333:6.8000 32 8 0.010618 0.000088 0.082050 0.000097 1.712920 0.000030 4039
38: 3365:6.8500 32 8 0.008477 0.000039 0.072845 0.000063 1.726360 0.000037 3785
39: 3334:6.9000 32 8 0.007124 0.000019 0.065141 0.000046 1.739310 0.000032 3849
40: 3343:6.9500 32 8 0.006224 0.000023 0.058699 0.000054 1.751810 0.000026 4350
41: 3314:7.0000 32 8 0.005508 0.000010 0.053122 0.000033 1.763950 0.000022 4546
42: 3329:7.0800 32 8 0.004520 0.000008 0.044391 0.000025 1.782670 0.000026 4126
43: 5697: beta ns nt rect direct pgm dpgm pb_dmdu_p_ud dpb_dmdu_p_ud N
44: 3331:6.4580 32 8 0.842593 0.000071 0.862479 0.000083 -4.89334 0.00016 1775
45: 3324:6.5000 32 8 0.862392 0.000060 0.883637 0.000070 -4.88978 0.00012 3975
46: 3304:6.5500 32 8 0.885542 0.000055 0.908170 0.000060 -4.88084 0.00011 4355
47: 3301:6.6000 32 8 0.907245 0.000051 0.931090 0.000067 -4.87389 0.00011 4345
48: 3329:6.6500 32 8 0.927926 0.000055 0.952879 0.000061 -4.86818 0.00013 4355

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49: 3310:6.7000 32 8 0.948170 0.000061 0.974103 0.000067 -4.85857 0.00013 1981  
 50: 3305:6.7600 32 8 0.970673 0.000075 0.997600 0.000081 -4.85143 0.00015 4021  
 51: 3287:6.8000 32 8 0.985080 0.000041 1.012640 0.000057 -4.84513 0.00007 4039  
 52: 3286:6.8500 32 8 1.002690 0.000052 1.030940 0.000057 -4.83712 0.00010 3785  
 53: 3307:6.9000 32 8 1.019700 0.000048 1.048640 0.000045 -4.82859 0.00006 3849  
 54: 3289:6.9500 32 8 1.036160 0.000039 1.065750 0.000036 -4.82118 0.00007 4350  
 55: 3268:7.0000 32 8 1.052230 0.000029 1.082380 0.000033 -4.81350 0.00005 4546  
 56: 3263:7.0800 32 8 1.077090 0.000041 1.108110 0.000042 -4.80150 0.00006 4126  
 57: 7663: beta ns nt pb\_dmdu\_p\_s dpb\_dmdu\_p\_s chl\_pbp\_d dchl\_pbp\_d chl\_pbp\_c dchl\_pbp\_c N  
 58: 3109:6.4580 32 8 -4.83989 0.00018 0.52250 0.06080 1.02650 0.00200 1775  
 59: 3083:6.5000 32 8 -4.84434 0.00015 0.56050 0.04090 1.04170 0.00100 3975  
 60: 3087:6.5500 32 8 -4.84323 0.00010 0.59140 0.03540 1.06280 0.00180 4355  
 61: 3086:6.6000 32 8 -4.84295 0.00011 0.63190 0.05040 1.09260 0.00240 4345  
 62: 3102:6.6500 32 8 -4.84294 0.00015 0.97190 0.14440 1.14210 0.00290 4355  
 63: 3094:6.7000 32 8 -4.83813 0.00012 0.63180 0.06810 1.19440 0.00350 1981  
 64: 3095:6.7600 32 8 -4.83564 0.00016 0.35490 0.06780 1.11320 0.00370 4021  
 65: 3085:6.8000 32 8 -4.83176 0.00009 0.18440 0.01650 1.02140 0.00350 4039  
 66: 3087:6.8500 32 8 -4.82621 0.00007 0.06000 0.00400 0.92770 0.00260 3785  
 67: 3097:6.9000 32 8 -4.81949 0.00007 0.02640 0.00200 0.85660 0.00140 3849  
 68: 3080:6.9500 32 8 -4.81346 0.00007 0.01500 0.00240 0.80890 0.00240 4350  
 69: 3070:7.0000 32 8 -4.80702 0.00005 0.00660 0.00080 0.77090 0.00120 4546  
 70: 3076:7.0800 32 8 -4.79685 0.00006 0.00330 0.00110 0.72670 0.00100 4126  
 71: 7501: beta ns nt Chl\_pbp\_t dchl\_pbp\_t Chl\_pbp\_s dchl\_pbp\_s Chl\_pbps\_d dchl\_pbps\_d N  
 72: 3069:6.4580 32 8 1.54900 0.06020 2.57550 0.05970 0.21590 0.02440 1775  
 73: 3044:6.5000 32 8 1.60210 0.04070 2.64380 0.04040 0.21770 0.01840 3975  
 74: 3066:6.5500 32 8 1.65410 0.03560 2.71690 0.03590 0.18960 0.01350 4355  
 75: 3030:6.6000 32 8 1.72450 0.05210 2.81710 0.05370 0.21510 0.02030 4345  
 76: 3051:6.6500 32 8 2.11400 0.14540 3.25610 0.14650 0.22980 0.04460 4355  
 77: 3063:6.7000 32 8 1.82620 0.06870 3.02060 0.06940 0.18950 0.01910 1981  
 78: 3062:6.7600 32 8 1.46810 0.06940 2.58120 0.07130 0.17990 0.02760 4021  
 79: 3047:6.8000 32 8 1.20580 0.01730 2.22720 0.01870 0.15730 0.01690 4039  
 80: 3069:6.8500 32 8 0.98770 0.00560 1.91530 0.00770 0.09220 0.00750 3785  
 81: 3059:6.9000 32 8 0.88300 0.00290 1.73960 0.00410 0.05790 0.00560 3849  
 82: 3035:6.9500 32 8 0.82400 0.00470 1.63290 0.00700 0.04860 0.00500 4350  
 83: 3042:7.0000 32 8 0.77740 0.00170 1.54830 0.00290 0.02480 0.00190 4546  
 84: 3035:7.0800 32 8 0.72990 0.00170 1.45660 0.00250 0.01410 0.00190 4126  
 85: 7959: beta ns nt Chl\_pbps\_c dchl\_pbps\_c Chl\_pbps\_t dchl\_pbps\_t Chl\_pbp\_ss dchl\_pbp\_ss N  
 86: 3049:6.4580 32 8 0.64030 0.00030 0.85620 0.02430 1.49650 0.02420 1775  
 87: 3060:6.5000 32 8 0.66010 0.00020 0.87780 0.01850 1.53790 0.01850 3975  
 88: 3037:6.5500 32 8 0.68060 0.00030 0.87020 0.01350 1.55080 0.01350 4355  
 89: 3030:6.6000 32 8 0.69830 0.00030 0.91340 0.02040 1.61170 0.02050 4345  
 90: 3052:6.6500 32 8 0.71570 0.00050 0.94550 0.04490 1.66120 0.04510 4355  
 91: 3048:6.7000 32 8 0.73430 0.00070 0.92390 0.01900 1.65820 0.01900 1981  
 92: 3057:6.7600 32 8 0.74860 0.00070 0.92850 0.02720 1.67700 0.02680 4021  
 93: 3040:6.8000 32 8 0.75210 0.00040 0.90940 0.01690 1.66140 0.01700 4039  
 94: 3049:6.8500 32 8 0.75010 0.00030 0.84230 0.00760 1.59240 0.00760 3785  
 95: 3047:6.9000 32 8 0.74290 0.00040 0.80080 0.00550 1.54370 0.00540 3849  
 96: 3038:6.9500 32 8 0.73190 0.00020 0.78040 0.00490 1.51230 0.00490 4350  
 97: 3043:7.0000 32 8 0.71990 0.00020 0.74470 0.00180 1.46470 0.00180 4546  
 98: 3014:7.0800 32 8 0.70030 0.00020 0.71440 0.00190 1.41480 0.00210 4126

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99: 6393: beta ns nt chl_II dchl_II Chl_0ud dchl_0ud Chl_S dchl_S Chl_BB dchl_BB N
100: 3437:6.4580 32 8 0.0589 0.0026 0.1293 0.4416 0.0333 0.0192 0.0557 0.0768 1775
101: 3425:6.5000 32 8 0.0858 0.0019 0.0762 0.2688 0.0467 0.0160 0.0006 0.0474 3975
102: 3394:6.5500 32 8 0.1242 0.0019 0.3347 0.2304 0.0570 0.0122 0.0435 0.0390 4355
103: 3391:6.6000 32 8 0.1818 0.0032 0.7501 0.1600 0.1344 0.0109 0.1280 0.0282 4345
104: 3419:6.6500 32 8 0.2579 0.0032 0.8474 0.1600 0.2490 0.0109 0.1664 0.0307 4355
105: 3423:6.7000 32 8 0.3482 0.0038 1.0899 0.1472 0.3590 0.0141 0.2413 0.0275 1981
106: 3386:6.7600 32 8 0.4077 0.0032 1.4528 0.0627 0.5126 0.0102 0.3200 0.0122 4021
107: 3406:6.8000 32 8 0.4339 0.0026 1.6723 0.0512 0.6106 0.0128 0.3629 0.0102 4039
108: 3433:6.8500 32 8 0.4480 0.0019 1.7594 0.0448 0.7104 0.0090 0.4026 0.0096 3785
109: 3430:6.9000 32 8 0.4576 0.0013 1.7920 0.0358 0.7610 0.0083 0.4192 0.0077 3849
110: 3424:6.9500 32 8 0.4627 0.0013 1.7690 0.0314 0.8096 0.0077 0.4282 0.0064 4350
111: 3422:7.0000 32 8 0.4659 0.0006 1.8656 0.0326 0.8346 0.0070 0.4480 0.0064 4546
112: 3432:7.0800 32 8 0.4742 0.0013 1.8618 0.0294 0.8870 0.0064 0.4595 0.0058 4126
113: 4725: beta ns nt chi_YY dchi_YY chi_VB dchi_YB 0_11 d0_11 N
114: 3105:6.4580 32 8 -0.0070 0.0461 -0.00256 0.04992 -0.02688 0.10880 1775
115: 2997:6.5000 32 8 0.0416 0.0256 0.00448 0.03072 -0.06656 0.07040 3975
116: 2989:6.5500 32 8 0.0685 0.0230 0.03200 0.02688 -0.04032 0.05760 4355
117: 2968:6.6000 32 8 0.1267 0.0179 0.06016 0.01792 0.00576 0.03968 4345
118: 3009:6.6500 32 8 0.1696 0.0147 0.04416 0.01664 -0.04608 0.03840 4355
119: 3004:6.7000 32 8 0.2099 0.0160 0.04160 0.01728 -0.07552 0.03648 1981
120: 3008:6.7600 32 8 0.2995 0.0077 0.04992 0.00768 -0.04416 0.01600 4021
121: 2990:6.8000 32 8 0.3610 0.0077 0.05632 0.00576 -0.01536 0.01280 4039
122: 2994:6.8500 32 8 0.3923 0.0064 0.04032 0.00576 -0.00832 0.01152 3785
123: 2999:6.9000 32 8 0.4096 0.0051 0.03200 0.00448 -0.00960 0.00896 3849
124: 2998:6.9500 32 8 0.4192 0.0051 0.01728 0.00384 -0.02048 0.00768 4350
125: 2933:7.0000 32 8 0.4358 0.0045 0.02240 0.00448 0.00064 0.00832 4546
126: 3015:7.0800 32 8 0.4493 0.0045 0.00896 0.00384 -0.00896 0.00768 4126
127: 4659: beta ns nt 0_ss d0_ss 0_ls d0_ls C_ss dC_ss dS1 ddS1 N
128: 3779:6.4580 32 8 -0.0064 0.0192 0.0429 0.0301 0.0397 0.0006 -1.30e-02 1.40e-02 1775
129: 3819:6.5000 32 8 -0.0115 0.0160 -0.0294 0.0186 0.0582 0.0013 -2.55e-03 1.10e-02 3975
130: 3833:6.5500 32 8 -0.0358 0.0115 -0.0326 0.0160 0.0928 0.0019 -4.26e-03 8.20e-03 4355
131: 3782:6.6000 32 8 -0.0192 0.0109 -0.0294 0.0141 0.1536 0.0026 6.32e-04 7.60e-03 4345
132: 3735:6.6500 32 8 0.0051 0.0109 -0.0243 0.0141 0.2438 0.0038 9.30e-04 7.40e-03 4355
133: 3727:6.7000 32 8 -0.0243 0.0141 0.0000 0.0160 0.3827 0.0058 1.80e-02 7.70e-03 1981
134: 3768:6.7600 32 8 -0.0198 0.0102 -0.0115 0.0077 0.5325 0.0070 1.42e-03 7.10e-03 4021
135: 3827:6.8000 32 8 -0.0141 0.0115 -0.0269 0.0096 0.6246 0.0051 -5.12e-03 5.70e-03 4039
136: 3745:6.8500 32 8 0.0070 0.0083 -0.0134 0.0064 0.7034 0.0038 2.28e-03 4.80e-03 3785

```

## P4RHMC Results

### P4RHMC therm 200

1: 772:p4b3.46 10 200  
2: 3241:hmc 1190 2.28373717815602 0.984500662798978 0.551609342143434  
3: 559:pbp 2380  
4: 5310:3.13000000000000001e-02 0.154777072752859 0.000139565558530418 1.75528227862555e-06 3.05790  
5: 5227:3.1300000000000000e-03 0.072509561571813 0.00021420704444221 3.28965745242429e-06 7.131703  
6: 4880:plaq 1190 0.524127107855863 2.63239285929818e-05 1.02630092094242e-07 1.25006262553322e-08  
7: 4913:rect 1190 0.284086514782008 3.61890368987989e-05 1.78625324171321e-07 2.17132217666611e-08  
8: 5057:wline 4760 0.00477080929890535 0.000517133006954068 8.01432019122566e-05 5.41721256485592e-06  
9: 775:p4b3.49 10 200  
10: 3071:hmc 2710 1.82133135838189 1.06237356950062 0.6338760577251  
11: 557:pbp 5420  
12: 5418:2.8999999999999998e-03 0.051436066739793 0.000142922378040301 4.24390722615055e-06 6.9503  
13: 5413:2.90000000000000001e-02 0.130782205297505 8.57867676777658e-05 1.71168630191889e-06 2.6989  
14: 4908:plaq 2700 0.531122685754042 1.52292184339761e-05 9.36413976260209e-08 7.65996118152651e-09  
15: 4878:rect 2700 0.292728754722416 2.10445976604369e-05 1.6680485329279e-07 1.49269321691389e-08  
16: 5140:wline 10880 0.00909503187335116 0.000317085733765189 8.43965377493829e-05 3.247512405178e-06  
17: 768:p4b3.51 10 200  
18: 3235:hmc 4110 1.68205220657853 0.994007727215251 0.593649353953963  
19: 556:pbp 8200  
20: 5351:2.5899999999999999e-02 0.113053828433919 7.50413724218205e-05 2.085707617201e-06 2.770735  
21: 5507:2.5899999999999999e-03 0.0399906915876792 0.000136271552911579 6.52002281118241e-06 8.588  
22: 4870:plaq 4100 0.53534962303888 1.24392081774682e-05 9.38904657892942e-08 5.63144562801235e-09  
23: 4932:rect 4100 0.297942476861794 1.77971688825512e-05 1.78193176198009e-07 1.20796300042849e-08  
24: 5083:wline 16360 0.0117859715771053 0.000283312990251347 9.39536669135908e-05 3.06809515680378e-06  
25: 771:p4b3.54 10 200  
26: 3193:hmc 4080 1.29669794865062 1.00028029715789 0.627002386552576  
27: 561:pbp 8160  
28: 5463:2.3999999999999998e-03 0.0216060135269103 0.000140129890722848 7.33063118441672e-06 4.940  
29: 5369:2.4000000000000000e-02 0.0932624178254974 7.87764673034942e-05 2.3345708780525e-06 1.7535  
30: 4901:plaq 4080 0.541530409486011 1.26591216654537e-05 9.81380142505803e-08 4.95090878107549e-09  
31: 4933:rect 4070 0.305640360675882 1.78239207278186e-05 1.83883924908681e-07 9.35388780254322e-08  
32: 5000:wline 16240 0.0229654543738329 0.000308440170209806 0.000101374935719046 3.39714094589024e-06  
33: 774:p4b3.57 10 200  
34: 3215:hmc 3460 1.04787405896927 1.04055463095274 0.692479369634969  
35: 563:pbp 6920  
36: 5506:2.1199999999999999e-03 0.0110721341287027 7.08505022690926e-05 1.57499293223534e-06 1.144  
37: 5415:2.1200000000000000e-02 0.0742735543252463 6.93164987652464e-05 1.52162925251971e-06 9.906  
38: 4879:plaq 3480 0.547281148948133 1.1266239714398e-05 7.86883407528611e-08 3.31617405847953e-09  
39: 4911:rect 3480 0.312812395073295 1.60465583026745e-05 1.45326448293116e-07 6.82277960442566e-08  
40: 4991:wline 13880 0.0338377114851172 0.000353151332773042 0.000112632461870988 4.66968502091211e-06  
41: 768:p4b3.60 10 200  
42: 3228:hmc 5070 0.922245135638793 1.01900204992081 0.705702659572893  
43: 604:pbp 10180  
44: 5531:1.9199999999999998e-02 0.0614216098474517 3.27272935841719e-05 5.00912905350844e-07 3.344  
45: 5443:1.9200000000000000e-03 0.00715418390565554 2.18668006572306e-05 2.25389217761111e-07 2.52  
46: 4916:plaq 5080 0.552523931794401 7.93823783740037e-06 6.75409155394746e-08 2.19923500167612e-09  
47: 4916:rect 5080 0.319317180421799 1.09605449074172e-05 1.22292755426996e-07 4.14348889347121e-08

48: 4942:wline 20320 0.042592212401998 0.000262480576539934 0.000105049463510276 2.93123703334978  
49: 771:p4b3.63 10 200  
50: 3240:hmc 6660 0.890024324874446 1.04090453146678 0.707195855317339  
51: 605:pbp 13340  
52: 5487:1.6999999999999999e-03 0.00539693553017885 1.1197547377436e-05 7.8521002428067e-08 1.0607  
53: 5292:1.70000000000000001e-02 0.0503982071503273 2.5122223678201e-05 3.9612979544077e-07 2.2098  
54: 4939:plaq 6650 0.557545489179279 7.60045597121762e-06 7.18154729049022e-08 2.37616371299571e-0  
55: 4890:rect 6650 0.325567529555828 1.08310314251138e-05 1.35033410847375e-07 4.89115921360218e-0  
56: 4940:wline 26600 0.051358420056941 0.000237473239537841 0.000110134145508654 2.78467063606645  
57: 774:p4b3.66 10 200  
58: 3239:hmc 5870 0.829130572344353 1.01634035935656 0.699064762229276  
59: 611:pbp 11780  
60: 5534:1.6999999999999999e-03 0.0049164643691585 6.49119689408213e-06 2.30043172913184e-08 3.038  
61: 5402:1.70000000000000001e-02 0.0473260332097825 1.87076650436219e-05 1.91699732279878e-07 1.173  
62: 4932:plaq 5880 0.562296737976232 7.95297757748043e-06 7.01152404314382e-08 2.60398545430608e-0  
63: 4906:rect 5890 0.331476920803165 1.15384160328961e-05 1.36901024386448e-07 5.09466930705329e-0  
64: 5042:wline 23560 0.0597602511866869 0.000246884242391874 0.000103156372436771 2.97846986522718  
65: 777:p4b3.69 10 200  
66: 3222:hmc 7210 0.803255986745504 1.01103032594437 0.699205930346646  
67: 605:pbp 14420  
68: 5469:1.5000000000000000e-03 0.00405507461385131 3.61758954314678e-06 8.84304387884115e-09 1.98  
69: 5545:1.4999999999999999e-02 0.0397482479693218 1.20780722461758e-05 9.80087466125935e-08 5.61  
70: 4915:plaq 7210 0.566917268386676 6.30195625521702e-06 6.20173831294813e-08 1.72537923030976e-0  
71: 4910:rect 7210 0.337254661780662 8.92722589764644e-06 1.16733610134774e-07 3.41375000767264e-0  
72: 5016:wline 28760 0.0675337666456396 0.000241455147282892 0.000112960200710853 2.64748546415704  
73: 775:p4b3.76 10 200  
74: 3183:hmc 7440 0.75174762806924 1.02511357778229 0.723619646321822  
75: 610:pbp 14920  
76: 5590:1.3899999999999999e-02 0.0335654423438473 6.58939394518621e-06 2.98893971539193e-08 1.709  
77: 5466:1.3900000000000000e-03 0.00337892616349965 1.20959241258916e-06 1.01888916086653e-09 1.35  
78: 4921:plaq 7450 0.577119606770267 5.88067788005432e-06 5.95743810250343e-08 1.51528350840478e-0  
79: 4925:rect 7470 0.350094405928046 8.46569746876088e-06 1.16112171509653e-07 2.98342438024745e-0  
80: 5010:wline 29880 0.0850653261373049 0.000249213957510998 0.000119832347241604 3.1765225730136  
81: 768:t0b3.60 10 200  
82: 3179:hmc 1170 0.75221752298838 1.03082422115292 0.695799255556701  
83: 555:pbp 2340  
84: 5376:1.9199999999999998e-02 0.07117883553192 7.5507158332097e-05 5.30512466325487e-07 1.24029  
85: 5387:1.9200000000000000e-03 0.0224479156995268 0.000125328099529471 1.37686620558643e-06 3.45  
86: 4902:plaq 1160 0.552175947425559 1.10755226781022e-05 2.16942422914812e-08 1.89062706657923e-0  
87: 4878:rect 1160 0.31875911329621 1.51809143117196e-05 3.83570646797099e-08 3.91185426449688e-0  
88: 5104:wline 4680 6.23803007292929e-05 0.00043238514406515 9.47202351777235e-05 6.4382833062136  
89: 774:t0b3.66 10 200  
90: 3228:hmc 1100 0.419194410873643 1.01917733011626 0.763885272577777  
91: 550:pbp 2200  
92: 5501:1.6999999999999999e-03 0.0140417957989537 0.000140469166082604 1.67309177833798e-06 3.10  
93: 5469:1.70000000000000001e-02 0.0554972358613402 7.77919808171996e-05 5.28565249886424e-07 9.60  
94: 4894:plaq 1100 0.562096267223483 1.10863763059734e-05 1.96223520907177e-08 1.75811564541229e-0  
95: 4840:rect 1100 0.331140561380034 1.6956163885431e-05 3.97769588319743e-08 4.02217821451802e-0  
96: 5128:wline 4400 -8.56495079405035e-05 0.000389038394349093 9.281033910898e-05 5.4196099338464  
97: 775:t0b3.76 10 200



98: 3292:hmc 1120 0.272532243959523 0.978577634541029 0.797430099891305  
99: 552:pbp 2220  
100: 5576:1.3899999999999999e-02 0.0385520686932971 5.85569689214383e-05 3.02723174894919e-07 4.79  
101: 5337:1.3900000000000000e-03 0.00694950520088004 0.000115338507846972 1.16174407340151e-06 1.9  
102: 4908:plaq 1120 0.577044970740007 7.98533434508519e-06 1.50112665649243e-08 1.03563677297357e-  
103: 4846:rect 1120 0.349960203436981 1.22532423072337e-05 3.0398172698514e-08 2.29575202948635e-  
104: 5169:wline 4480 -0.000444075232980279 0.000399122430490894 8.56200719992258e-05 4.8615684942

## P4RHMC therm 400

1: 774:p4b3.46 10 400  
2: 3256:hmc 1190 2.26830790508694 0.966069444367573 0.531318685658228  
3: 559:pbp 2380  
4: 5248:3.1300000000000001e-02 0.154877031091864 0.000142329189746802 1.4293305904646e-06 2.70955  
5: 5375:3.1300000000000000e-03 0.0727243505702389 0.000221544864494993 2.59730893535062e-06 6.393  
6: 4912:plaq 11900.524108089157706 2.79615616024058e-05 9.57104686777976e-08 1.21636060616116e-08  
7: 4967:rect 1190 0.284059408964193 3.94808878789794e-05 1.71465205297918e-07 2.24396237549886e-08  
8: 5098:wline 4760 0.00468799507410354 0.000572707001076091 7.92499381629699e-05 6.11659149246776e-  
9: 777:p4b3.49 10 400  
10: 3171:hmc 2710 1.85359209060518 1.07423736573773 0.602177015103896  
11: 557:pbp 5420  
12: 5494:2.8999999999999998e-03 0.0516226170612057 0.000132324694731675 3.15592878754395e-06 4.04  
13: 5372:2.9000000000000001e-02 0.130909518968597 7.74481722310581e-05 1.25385757543248e-06 1.206  
14: 4906:plaq 2700 0.531098415147283 1.42005647215898e-05 8.07000290795178e-08 4.09694715493035e-  
15: 4890:rect 2700 0.29269533878781 1.94769373694821e-05 1.41602430094698e-07 7.09612995325268e-08  
16: 5077:wline 10880 0.0087683480770993 0.000330656445294482 8.40906750733684e-05 3.46014341019479  
17: 770:p4b3.51 10 400  
18: 3209:hmc 4110 1.69270815841523 0.98368656587636 0.571743658749326  
19: 556:pbp 8200  
20: 5442:2.5899999999999999e-02 0.113274255499035 5.75791613208669e-05 1.11774735044687e-06 8.663  
21: 5444:2.5899999999999999e-03 0.0403761780168271 0.000107401269659251 3.53665223617006e-06 2.81  
22: 4866:plaq 4100 0.535320826910908 1.1039592070835e-05 7.81892680845908e-08 3.73606853875513e-09  
23: 4934:rect 4100 0.297898748051704 1.54521792780852e-05 1.41844832704068e-07 7.47673086227996e-  
24: 5064:wline 163600.0114420177255774 0.000282914588723104 9.12744525569792e-05 3.07183590179403e-  
25: 773:p4b3.54 10 400  
26: 3187:hmc 4080 1.29983974852126 0.98938535765126 0.610170712025543  
27: 561:pbp 8160  
28: 5501:2.3999999999999998e-03 0.0218409329705586 0.000135774006884327 6.49024774339672e-06 4.61  
29: 5401:2.4000000000000000e-02 0.0934485352173792 7.05591511395979e-05 1.75955384221464e-06 1.22  
30: 4853:plaq 4080 0.541506401452125 1.1902790706655e-05 8.81547097196632e-08 4.10394909038576e-09  
31: 4923:rect 4070 0.305605867099947 1.67426484057042e-05 1.63899216080953e-07 7.76096230166244e-  
32: 5055:wline 16240 0.0226347752143716 0.000309808005360193 9.97176042556564e-05 3.44725326922318  
33: 776:p4b3.57 10 400  
34: 3180:hmc 3460 1.05508827773737 1.04272054262724 0.672379982029412  
35: 563:pbp 6920  
36: 5479:2.1199999999999999e-03 0.0110810983057963 7.43752607125304e-05 1.63020081101726e-06 1.20  
37: 5407:2.1200000000000000e-02 0.0742949617173566 7.29333124330722e-05 1.58249284492638e-06 1.03  
38: 4946:plaq 3480 0.547275706159539 1.15829004045278e-05 7.80279189970574e-08 3.38383095832794e-  
39: 4904:rect 3480 0.312805165027086 1.63955442723764e-05 1.43334036948512e-07 6.82510717480876e-  
40: 5022:wline 13880 0.0340075819782278 0.000365309406927734 0.000112130381345688 4.85936525191529

41: 770:p4b3.60 10 400  
42: 3265:hmc 5070 0.928878016751397 1.01315159549878 0.693098919083509  
43: 604:pbp 10180  
44: 5504:1.9199999999999998e-02 0.0614187365646811 3.32934768729471e-05 4.9710789346817e-07 3.395  
45: 5394:1.9200000000000000e-03 0.00714846755611194 2.21458036433508e-05 2.2154780025482e-07 2.583  
46: 4960:plaq 5080 0.552523690935899 8.08658496516974e-06 6.74976448514528e-08 2.22927257167231e-0  
47: 4862:rect 5080 0.319317263200021 1.11402927791873e-05 1.22101595246741e-07 4.16740644005942e-0  
48: 4958:wline 20320 0.0425045243836545 0.000269860339007032 0.000105629407006006 3.0411719675222  
49: 773:p4b3.63 10 400  
50: 3228:hmc 6660 0.893925223974467 1.04020630858074 0.697841090311502  
51: 605:pbp 13340  
52: 5561:1.6999999999999999e-03 0.00539857053772747 1.14478429269957e-05 7.9534318110908e-08 1.09  
53: 5394:1.7000000000000001e-02 0.0503987359624288 2.56087460386463e-05 3.9895268973226e-07 2.2635  
54: 4844:plaq 66500.5575429247389 7.76017110009963e-06 7.18714019736666e-08 2.43786473794575e-09  
55: 4902:rect 6650 0.325564708813287 1.10698496162939e-05 1.35181768229309e-07 5.02701405240042e-0  
56: 5017:wline 26600 0.0512618878157485 0.000240381560284899 0.000109534967371129 2.81542342306178  
57: 776:p4b3.66 10 400  
58: 3247:hmc 5870 0.838314004603965 1.01392324386962 0.688061645674588  
59: 611:pbp 11780  
60: 5607:1.6999999999999999e-03 0.00491963325575021 6.68041518063196e-06 2.34999806869709e-08 3.1  
61: 5321:1.7000000000000001e-02 0.0473368914235153 1.90156807574774e-05 1.91001224225426e-07 1.18  
62: 4903:plaq 5880 0.562293110153143 8.09950086463117e-06 7.01212737393548e-08 2.66722431449185e-0  
63: 4934:rect 5890 0.331471883464184 1.17484827574255e-05 1.36461283838468e-07 5.17543179023693e-0  
64: 5030:wline 235600.0596343455977653 0.000249606693286333 0.000102268857080933 2.98904709401481  
65: 779:p4b3.69 10 400  
66: 3231:hmc 7210 0.808083600926078 1.00578261267192 0.690372036964756  
67: 605:pbp 14420  
68: 5464:1.5000000000000000e-03 0.00405402740368723 3.68612539471886e-06 8.91963575581785e-09 2.04  
69: 5456:1.4999999999999999e-02 0.039742698187188 1.23025151956547e-05 9.88436600738647e-08 5.7910  
70: 4887:plaq 7210 0.566915548477695 6.43032719772124e-06 6.19097515218406e-08 1.7603696882647e-09  
71: 4919:rect 7210 0.337253177589456 9.11987536729282e-06 1.16662167203062e-07 3.48803098209055e-0  
72: 5049:wline 28760 0.0674787863946478 0.000245588198293579 0.000112772177066252 2.70153417208097  
73: 777:p4b3.76 10400  
74: 3202:hmc 7440 0.75713658840693 1.02337044865544 0.715767931728693  
75: 610:pbp 14920  
76: 5563:1.3899999999999999e-02 0.0335697051116886 6.65954088351637e-06 2.96716893685125e-08 1.72  
77: 5456:1.3900000000000000e-03 0.00337956369482169 1.23227153235858e-06 1.02793313393956e-09 1.42  
78: 4956:plaq 7450 0.577117641576659 5.99797042672912e-06 5.96534774575754e-08 1.53922741055149e-0  
79: 4911:rect 7470 0.350091717734103 8.64198406712883e-06 1.16403478854768e-07 3.02732931734144e-0  
80: 5026:wline 29880 0.0850537969406837 0.000254906846370454 0.000120776276601328 3.25138085289203  
81: 770:t0b3.60 10 400  
82: 3315:hmc 11700.742376383589032 0.984902936488737 0.688582343831169  
83: 555:pbp 2340  
84: 5464:1.9199999999999998e-02 0.0714589293360704 4.379186238986e-05 1.28937007909269e-07 2.08952  
85: 5383:1.9200000000000000e-03 0.0229255407151004 7.22943711927537e-05 2.63419972669611e-07 5.302  
86: 4863:plaq 1160 0.552163412341445 1.20816256730995e-05 2.11092389021833e-08 2.04023761256621e-0  
87: 4928:rect 11600.318737388543534 1.66576568870565e-05 3.72092081884826e-08 4.30710452177097e-09  
88: 5193:wline 4680 -5.85079310776415e-05 0.000429653137027444 8.6616078517946e-05 6.1666657776282  
89: 776:t0b3.66 10 400  
90: 2939:hmc 11000.446451390789203 1.009022611732160.7570807056

91: 550:pbp 2200  
92: 5559:1.6999999999999999e-03 0.0146479711850389 7.02992639329184e-05 2.49839023432037e-07 6.513  
93: 5353:1.7000000000000000e-02 0.055843937201486 3.41274614642902e-05 6.99127349016277e-08 1.5742  
94: 4930:plaq 1100 0.562063266452948 9.54571232953905e-06 1.46224408874891e-08 1.08989055497663e-0  
95: 4797:rect 1100 0.33108483526125 1.38076217709706e-05 2.70318219895506e-08 2.2664541982793e-09  
96: 5146:wline 4400 -0.000429493385300843 0.000428816954009981 9.23833354106436e-05 6.105074882200  
97: 777:t0b3.76 10 400  
98: 3270:hmc 11200.284600816125053 0.970745276230174 0.790207479166667  
99: 552:pbp 2220  
100: 5537:1.3899999999999999e-02 0.0388090725947052 3.02710031244856e-05 5.77683667353935e-08 1.03  
101: 5469:1.3900000000000000e-03 0.00743037640061469 6.73865165844095e-05 2.76252354944837e-07 5.0  
102: 4935:plaq 1120 0.577028650533484 7.91657845685129e-06 1.28375358568775e-08 8.31155587334085e-  
103: 4922:rect 1120 0.349931957137755 1.17098243010848e-05 2.50199260796385e-08 1.71698302383937e-  
104: 5203:wline 4480 -0.000369682622225213 0.000436772792186786 8.38439805926168e-05 5.63438594763

## P4RHMC therm 600

1: 776:p4b3.46 10 600  
2: 3158:hmc 1190 2.22294960984301 1.01127574711314 0.540457734186441  
3: 559:pbp 2380  
4: 5264:3.1300000000000000e-02 0.154892046221209 0.000163832524247446 1.40587650831366e-06 2.56312  
5: 5354:3.1300000000000000e-03 0.0728358361297706 0.000256604395763254 2.57651128555722e-06 6.1683  
6: 4888:plaq 1190 0.524123076177381 3.40661130359398e-05 1.03071516845062e-07 1.49441517804886e-08  
7: 4809:rect 1190 0.28407693333504 4.76820402427467e-05 1.84657875755109e-07 2.7411261763835e-08  
8: 5033:wline 4760 0.00494311574075788 0.000634290902381883 7.4297680581571e-05 6.70457555074424e-  
9: 779:p4b3.49 10 600  
10: 3199:hmc 2710 1.87193892071189 1.06892256652358 0.564468675303318  
11: 557:pbp 5420  
12: 5491:2.8999999999999998e-03 0.0515073339721873 0.000137387458683526 3.09445918904089e-06 4.245  
13: 5326:2.9000000000000000e-02 0.130845307574014 8.10595025361931e-05 1.25391003293854e-06 1.2782  
14: 4846:plaq 2700 0.531092710567085 1.4927094420713e-05 7.95437287220186e-08 4.38505338223842e-09  
15: 4824:rect 2700 0.292693903848865 2.061522646518e-05 1.41532736894146e-07 7.62179188955521e-09  
16: 5083:wline 10880 0.00894800659996806 0.00035105899403217 8.42881677005643e-05 3.71989102913019  
17: 772:p4b3.51 10 600  
18: 3265:hmc 4110 1.67182688217686 0.975899656347828 0.571444513937322  
19: 556:pbp 8200  
20: 5477:2.5899999999999999e-02 0.113321310865038 5.89261916049281e-05 1.10647747123483e-06 8.8356  
21: 5456:2.5899999999999999e-03 0.040476056570732 0.000109725165732529 3.47392072697767e-06 2.8999  
22: 4900:plaq 4100 0.535320984504162 1.14812751710458e-05 7.95625692265719e-08 3.90903109404567e-0  
23: 4865:rect 4100 0.297894213218518 1.59763816497404e-05 1.4320479361626e-07 7.79127539133138e-09  
24: 4966:wline 16360 0.0112146277531942 0.00028642134686393 9.0755557515981e-05 3.10712264875198e-  
25: 775:p4b3.54 10 600  
26: 3258:hmc 4080 1.30863746833297 0.985075754723211 0.608099288679309  
27: 561:pbp 8160  
28: 5478:2.3999999999999998e-03 0.0218540603315167 0.000141898198067623 6.71029081570833e-06 4.840  
29: 5457:2.4000000000000000e-02 0.0934676676498867 7.31464669200508e-05 1.78951599556486e-06 1.265  
30: 4862:plaq 4080 0.541502004991791 1.2302315524359e-05 8.74297488418643e-08 4.17966750935711e-09  
31: 4909:rect 4070 0.305599419151634 1.73260674002148e-05 1.62802831815193e-07 7.92793530877286e-0  
32: 4954:wline 16240 0.0227966277009552 0.000318356624777104 0.00010024885518769 3.54072576011835e-  
33: 778:p4b3.57 10 600

34: 3190:hmc 3460 1.06593047976505 1.03616195932092 0.649469491262238  
35: 563:pbp 6920  
36: 5514:2.1199999999999999e-03 0.0110325247292922 7.80319285730651e-05 1.67968032572671e-06 1.300  
37: 5369:2.1200000000000000e-02 0.0742189951418474 7.5580632730274e-05 1.58866348197691e-06 1.123  
38: 4924:plaq 3480 0.547275848595447 1.21761023272234e-05 7.82166026503599e-08 3.57538493750075e-0  
39: 4905:rect 3480 0.312808326629841 1.72441932560048e-05 1.44745660563294e-07 7.18568462445211e-0  
40: 4900:wline 13880 0.0342226298648401 0.000384609704793439 0.00011316060733033 5.1429811985923e-  
41: 772:p4b3.60 10 600  
42: 3264:hmc 5070 0.941279877143982 1.00476670659248 0.679367327096195  
43: 604:pbp 10180  
44: 5480:1.9199999999999998e-02 0.0614352701852741 3.40239383969032e-05 4.9704533664256e-07 3.492  
45: 5445:1.9200000000000000e-03 0.00714992860520512 2.28681649701268e-05 2.26271505442232e-07 2.68  
46: 4928:plaq 5080 0.552517811638668 8.28110648898584e-06 6.68215422366005e-08 2.27331009588835e-0  
47: 4875:rect 5080 0.319309908351769 1.14143024159161e-05 1.20701194300509e-07 4.25312768143368e-0  
48: 4937:wline 20320 0.042374882015949 0.000274307408316235 0.000104819308404316 3.12124889762836  
49: 775:p4b3.63 10 600  
50: 3231:hmc 6660 0.895500012932011 1.03221872121484 0.687868849067657  
51: 605:pbp 13340  
52: 5575:1.6999999999999999e-03 0.00539917141846998 1.17471397566525e-05 8.10734754001604e-08 1.12  
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54: 4911:plaq 6650 0.557542330900055 7.93182527638662e-06 7.21184756927059e-08 2.50222465083704e-0  
55: 4928:rect 6650 0.325564845035723 1.13267268989033e-05 1.36009057135099e-07 5.15687623365988e-0  
56: 5053:wline 26600 0.0512990296481795 0.000245824846808567 0.000109826465806169 2.8948963347460  
57: 778:p4b3.66 10 600  
58: 3232:hmc 5870 0.838427553726548 1.01053743221203 0.676223377958253  
59: 611:pbp 11780  
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61: 5416:1.7000000000000001e-02 0.0473506694940729 1.92030546605142e-05 1.87525769671555e-07 1.19  
62: 4953:plaq 5880 0.562288216728843 8.23841464785485e-06 6.93948223734013e-08 2.71669356287248e-0  
63: 4930:rect 5890 0.331465662774618 1.19627300182969e-05 1.35485178489208e-07 5.25857057010844e-0  
64: 5014:wline 23560 0.0595730348012094 0.000255727196612703 0.000102287239815852 3.0647068983941  
65: 781:p4b3.69 10 600  
66: 3207:hmc 7210 0.808342335637398 1.00423434660937 0.681003566071103  
67: 605:pbp 14420  
68: 5489:1.5000000000000000e-03 0.00405484443933713 3.78595978644393e-06 9.13309264929983e-09 2.10  
69: 5575:1.4999999999999999e-02 0.0397440410948649 1.25472611019545e-05 9.98412705863928e-08 5.92  
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75: 610:pbp 14920  
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78: 4862:plaq 7450 0.577115429812339 6.10634090372435e-06 5.9354153896824e-08 1.57016119660907e-0  
79: 4916:rect 7470 0.350089529243431 8.81572543217354e-06 1.16221935789806e-07 3.08280421793909e-0  
80: 5047:wline 29880 0.0851739079496313 0.000258778674634477 0.000119962175297622 3.3043748434118  
81: 772:t0b3.60 10 600  
82: 3328:hmc 1170 0.754907983926102 0.989902208550977 0.685886038578948  
83: 555:pbp 2340

84: 5512:1.9199999999999998e-02 0.0715177012510356 4.60119221603279e-05 1.01948565979044e-07 2.163  
85: 5352:1.9200000000000000e-03 0.0230582208043084 8.3216422768765e-05 2.52900000041564e-07 5.795  
86: 4852:plaq 1160 0.552161119253889 1.32531250831358e-05 1.98623512488529e-08 1.7395609273144e-09  
87: 4925:rect 1160 0.318734700111163 1.75903928968858e-05 3.33969259139894e-08 3.71443254671542e-09  
88: 5053:wline 4680 0.000198340989900581 0.00048649896836068 8.8501858691312e-05 7.66739061713904  
89: 778:t0b3.66 10 600  
90: 2959:hmc 1100 0.472215010290683 0.992132014993572 0.743779972  
91: 550:pbp 2200  
92: 5575:1.6999999999999999e-03 0.0148447200167276 5.82157639708388e-05 7.08778183949784e-08 3.500  
93: 5450:1.7000000000000000e-02 0.0559149553774833 3.12751730407965e-05 3.69535387191068e-08 8.866  
94: 4814:plaq 1100 0.56205674768016 1.04671028252924e-05 1.3936936849035e-08 1.18948691626677e-09  
95: 4792:rect 1100 0.331076732527526 1.56280331435729e-05 2.5662624559275e-08 2.6829536119062e-09  
96: 5114:wline 4400 -7.84211288898962e-05 0.000532270452091102 9.988336628208e-05 7.5551162307394  
97: 779:t0b3.76 10 600  
98: 3309:hmc 1120 0.275627557957297 0.975483006085166 0.792153459807693  
99: 552:pbp 2220  
100: 5566:1.3899999999999999e-02 0.0389282962804442 2.14701783521565e-05 1.65185868087344e-08 4.18  
101: 5447:1.3900000000000000e-03 0.00769094219218009 5.40761004251844e-05 9.95331105526766e-08 2.8  
102: 4816:plaq 1120 0.577022292640905 8.8332077685005e-06 1.2403961869386e-08 9.75139051687879e-10  
103: 4928:rect 1120 0.349922126437382 1.26995637649495e-05 2.31352508742391e-08 1.77969854308712e-09  
104: 5197:wline 4480 -0.000334357917152589 0.000542086895950229 8.67124990884498e-05 6.1541956346

## P4RHMC therm 800

1: 778:p4b3.46 10 800  
2: 3230:hmc 1190 2.21781084247611 0.867940109098179 0.536787421820512  
3: 559:pbp 2380  
4: 5271:3.1300000000000000e-02 0.155408793157475 0.000139262268369589 5.88049095640476e-07 1.39313  
5: 5315:3.1300000000000000e-03 0.0735757950623503 0.00027197839948154 1.56953023831456e-06 4.9344  
6: 4892:plaq 1190 0.524038465217624 3.00003429834583e-05 6.78306351713623e-08 9.28935290420653e-09  
7: 4896:rect 1190 0.283950046401501 4.16602329672697e-05 1.17492966244369e-07 1.69356007213047e-08  
8: 5042:wline 4760 0.00506116513708719 0.000894117140535173 8.48535150540902e-05 9.04564521432219  
9: 781:p4b3.49 10 800  
10: 3167:hmc 2710 1.87047141122112 1.07127044921677 0.564067090989529  
11: 557:pbp 5420  
12: 5442:2.8999999999999998e-03 0.0517580942407844 0.000132967417709693 2.49400932384138e-06 3.803  
13: 5280:2.9000000000000000e-02 0.1309948900884 7.87806291068086e-05 1.05446882098776e-06 1.149735  
14: 4926:plaq 2700 0.531071851327161 1.48746692431534e-05 7.45936981732794e-08 4.12061093966989e-09  
15: 4915:rect 2700 0.292665888862564 2.07100525288079e-05 1.33711380815553e-07 7.32960336464476e-08  
16: 5137:wline 10880 0.00873813713010517 0.000371822163381828 8.24459716506468e-05 3.7856892950957  
17: 774:p4b3.51 10 800  
18: 3163:hmc 4110 1.67530791542705 0.96972314609134 0.570513453151058  
19: 556:pbp 8200  
20: 5435:2.5899999999999999e-02 0.113320186263214 6.1891167959934e-05 1.15397511074663e-06 9.28968  
21: 5497:2.5899999999999999e-03 0.0405068081231172 0.000113893155713957 3.53969147674958e-06 3.028  
22: 4915:plaq 4100 0.535322327576295 1.17598869436017e-05 7.91829720512821e-08 4.00993396201827e-09  
23: 4892:rect 4100 0.297896517900871 1.64070171879962e-05 1.43064189839436e-07 7.9750276739727e-08  
24: 5049:wline 16360 0.0111290573491705 0.000295182037559183 9.08005597216452e-05 3.2135706039570  
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26: 3041:hmc 4080 1.30616120057779 0.994459025430051 0.610154013425

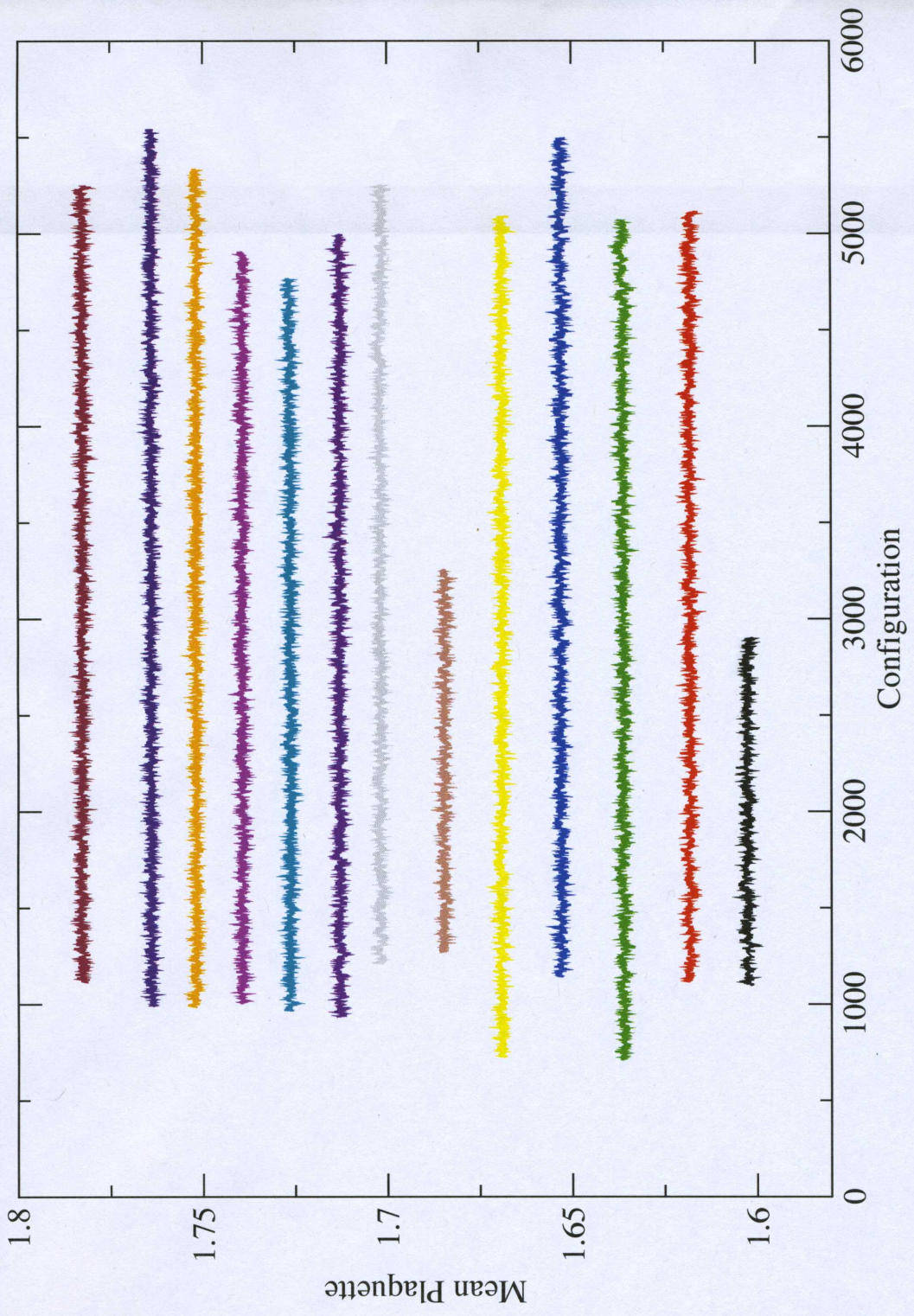
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32: 5052:wline 16240 0.0229960149745872 0.000323843005334585 9.91687779499053e-05 3.58678316472499e-06  
33: 780:p4b3.57 10 800  
34: 3186:hmc 3460 1.06453370980503 1.02825688931626 0.644938696804511  
35: 563:pbp 6920  
36: 5418:2.1199999999999999e-03 0.010971485656902 8.0915527078029e-05 1.68048402022935e-06 1.3924999999999999e-06  
37: 5425:2.1200000000000000e-02 0.0741420189587355 7.66612256136533e-05 1.51843988879985e-06 1.1639999999999999e-06  
38: 4911:plaq 3480 0.547283430807907 1.25532470273144e-05 7.81126463072465e-08 3.78779042207874e-09  
39: 4911:rect 3480 0.312819378794549 1.78000300413668e-05 1.43915034264334e-07 7.64327655023998e-08  
40: 4968:wline 13880 0.0346022900193649 0.000400407055066271 0.000114022804673042 5.44810455163297e-06  
41: 774:p4b3.60 10 800  
42: 3166:hmc 5070 0.945305360865075 1.00327353703354 0.66434940330679  
43: 604:pbp 10180  
44: 5494:1.9199999999999998e-02 0.0614726412691523 3.4182375518898e-05 4.78355222131696e-07 3.5304999999999998e-07  
45: 5461:1.9200000000000000e-03 0.00716521626947997 2.34986176126627e-05 2.28164742721211e-07 2.7699999999999998e-07  
46: 4861:plaq 5080 0.552510974161013 8.3830979148709e-06 6.54993181354121e-08 2.26062860982815e-09  
47: 4950:rect 5080 0.319299885907715 1.15357263291359e-05 1.18716980056695e-07 4.24660878496753e-08  
48: 5005:wline 20320 0.0423368089205184 0.000282965084733659 0.000104918119000676 3.22439637820975e-06  
49: 777:p4b3.63 10 800  
50: 3274:hmc 6660 0.894952460889569 1.02628036317176 0.677215908762799  
51: 605:pbp 13340  
52: 5515:1.6999999999999999e-03 0.0054033293234678 1.20810381152784e-05 8.29124265825425e-08 1.1559999999999999e-08  
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54: 4892:plaq 6650 0.557536357795685 7.99377621507033e-06 7.09105874633344e-08 2.5181041259698e-09  
55: 4856:rect 6650 0.325557139361642 1.14441681440951e-05 1.33985770185281e-07 5.2499219461191e-08  
56: 5017:wline 26600 0.0513294410630324 0.000251324337540867 0.000109867950018457 2.96585558648389e-06  
57: 780:p4b3.66 10 800  
58: 3234:hmc 5870 0.839171053006703 1.00550717810277 0.670785975607494  
59: 611:pbp 11780  
60: 5644:1.6999999999999999e-03 0.00492636579526888 6.98232449801878e-06 2.37643961454108e-08 3.2799999999999998e-08  
61: 5430:1.7000000000000001e-02 0.0473627056093668 1.95787974575073e-05 1.87500910247333e-07 1.2099999999999999e-07  
62: 4905:plaq 5880 0.56228562078732 8.35468086265378e-06 6.86743909134604e-08 2.76030992287679e-09  
63: 4927:rect 5890 0.331461834020731 1.21357652528972e-05 1.33918989322956e-07 5.31397809958332e-08  
64: 4978:wline 23560 0.0594331216359033 0.000259780553760312 0.000102021220848657 3.14863263208175e-06  
65: 783:p4b3.69 10 800  
66: 3225:hmc 7210 0.813191037499113 1.00334374085125 0.674951337992198  
67: 605:pbp 14420  
68: 5470:1.5000000000000000e-03 0.00405394236996891 3.88292650254013e-06 9.32040894060642e-09 2.1799999999999999e-09  
69: 5449:1.4999999999999999e-02 0.039737846153535 1.27307035550035e-05 9.9672121382823e-08 6.0949999999999998e-08  
70: 4908:plaq 7210 0.566910036482541 6.60156769146781e-06 6.12372192254334e-08 1.79121485067359e-09  
71: 4962:rect 7210 0.337246856644477 9.38095581936067e-06 1.15543664281477e-07 3.54896972395498e-08  
72: 5051:wline 28760 0.0676037781872537 0.000254466454247089 0.000112805569128599 2.80801793884593e-06  
73: 781:p4b3.76 10 800  
74: 3254:hmc 7440 0.758930000980699 1.01597801280567 0.698645517977411  
75: 610:pbp 14920  
76: 5484:1.3899999999999999e-02 0.0335651185003131 6.82058384064985e-06 2.93548325914068e-08 1.7739999999999999e-08

77: 5386:1.3900000000000000e-03 0.00337832234046011 1.2166536045267e-06 9.44238754220586e-10 1.38  
78: 4965:plaq 7450 0.577113509564914 6.18368935378767e-06 5.87415479966318e-08 1.58245315129788e-0  
79: 4965:rect 7470 0.350086887475369 8.91259766027726e-06 1.14934275280953e-07 3.08983808758973e-0  
80: 5060:wline 29880 0.0851602741814872 0.000264726967672694 0.000120403965891738 3.38174689299574  
81: 774:t0b3.60 10 800  
82: 3266:hmc 1170 0.756431735824422 0.961739710961271 0.679104231513513  
83: 555:pbp 2340  
84: 5549:1.9199999999999998e-02 0.0714537135842386 5.86759899004171e-05 1.07526175435558e-07 2.86  
85: 5368:1.9200000000000000e-03 0.0229282128541644 0.000104730887358465 2.57904276183886e-07 7.92  
86: 4860:plaq 1160 0.552156706277024 1.69229221509736e-05 2.08904262838989e-08 2.1916847320806e-09  
87: 4920:rect 1160 0.318731056331087 2.36693777950233e-05 3.65965625716589e-08 5.00006823729917e-0  
88: 5098:wline 4680 0.000855943900882632 0.000565160833709462 9.36332521868223e-05 1.023021312925  
89: 780:t0b3.66 10 800  
90: 2916:hmc 1100 0.480088160735593 1.02047516459572 0.754267893  
91: 550:pbp 2200  
92: 5579:1.6999999999999999e-03 0.0147697827845024 8.54798286715396e-05 1.25263460222821e-07 4.86  
93: 5439:1.7000000000000001e-02 0.0558903460294667 4.39178105538669e-05 4.46800813194992e-08 1.25  
94: 4900:plaq 1100 0.562057450615681 1.08036243906692e-05 1.25685342189374e-08 1.34990073557834e-0  
95: 4865:rect 1100 0.331079097816896 1.53020358772446e-05 2.0809104953982e-08 2.38688471549181e-09  
96: 5129:wline 4400 -0.00067834683324539 0.000687620104994277 9.26801363174267e-05 8.866189118906  
97: 781:t0b3.76 10 800  
98: 3147:hmc 1120 0.280593843614696 0.975932560807746 0.791467444375  
99: 552:pbp 2220  
100: 5560:1.3899999999999999e-02 0.0389217478184874 2.72555400581201e-05 1.66928581339094e-08 5.9  
101: 5406:1.3900000000000000e-03 0.0078657321121296 6.44060606035926e-05 7.25715226849814e-08 2.63  
102: 4879:plaq 1120 0.577021113695687 1.21818458380594e-05 1.25733503816838e-08 1.30045118203124e-0  
103: 4850:rect 1120 0.349922064624638 1.66668062256811e-05 2.32677506550177e-08 2.1625057993602e-0  
104: 5150:wline 4480 -0.000908162195266179 0.00072904085548889 8.82477888613217e-05 7.19158385069

## Diagnostic Results

# MILC 5K Plaquette

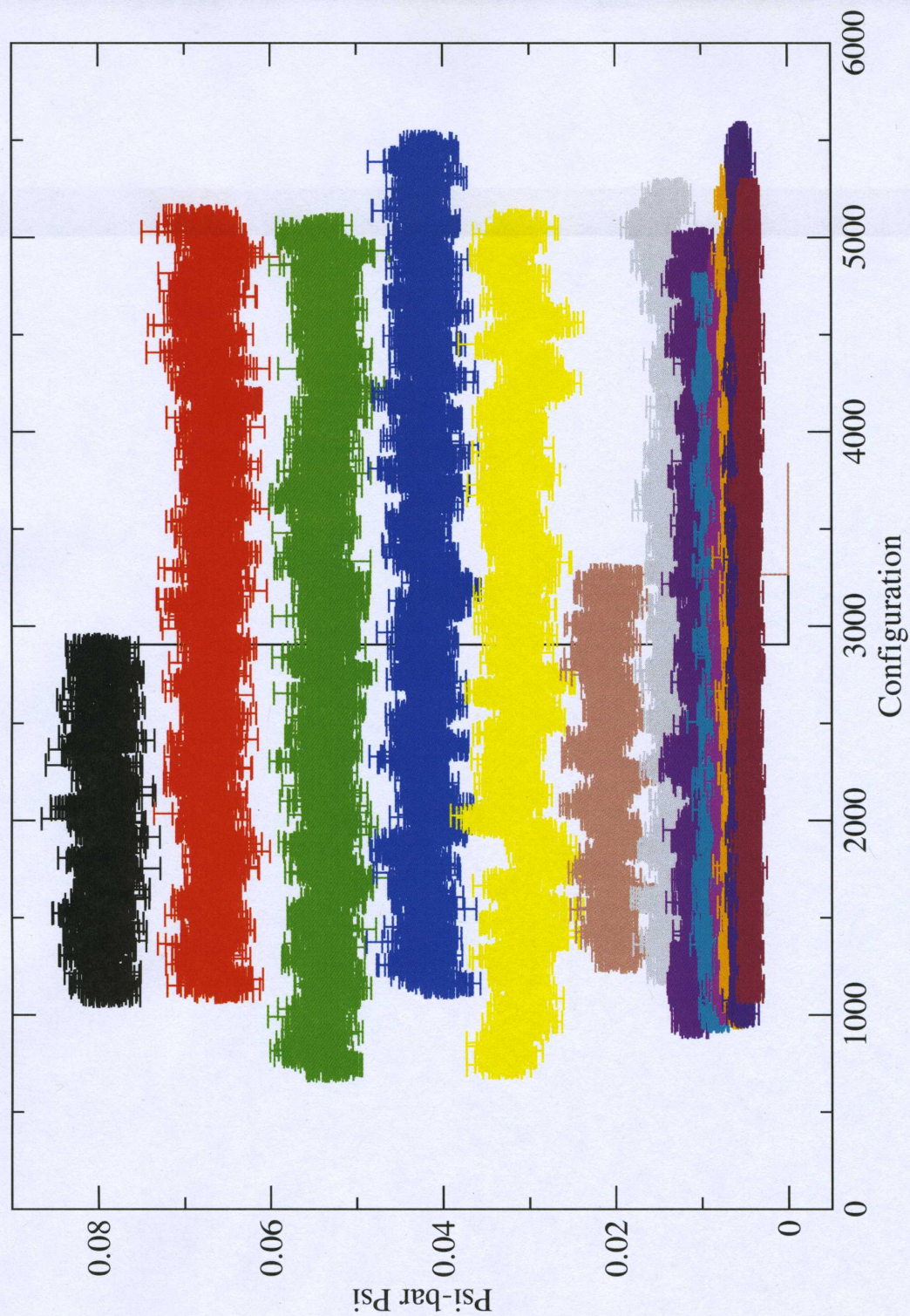
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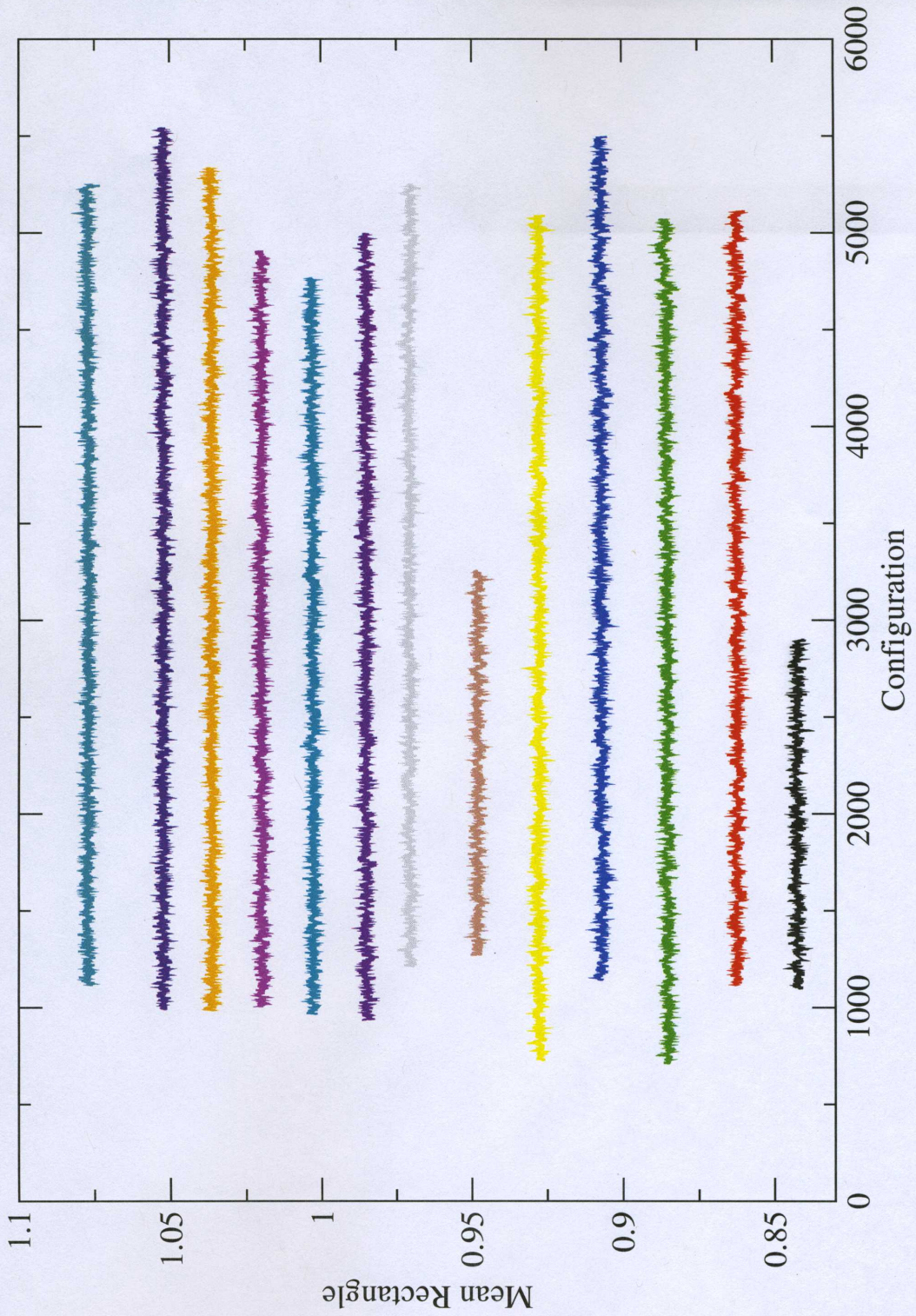
### MILC 5K Psi-bar Psi

beta = 6.458, 6.50, 6.55, 6.60, 6.65, 6.70, 6.76, 6.80, 6.85, 6.90, 6.95, 7.00, 7.08

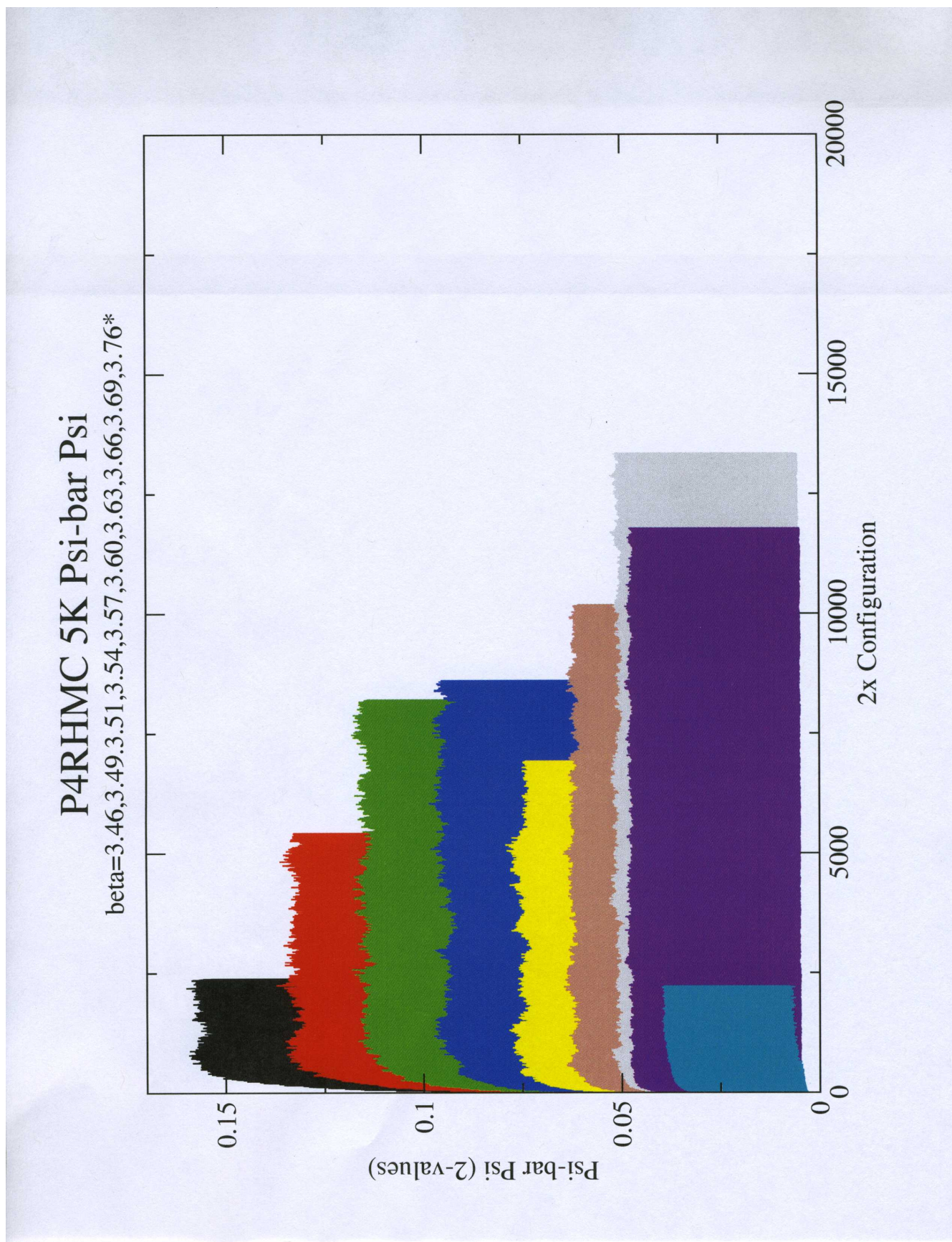


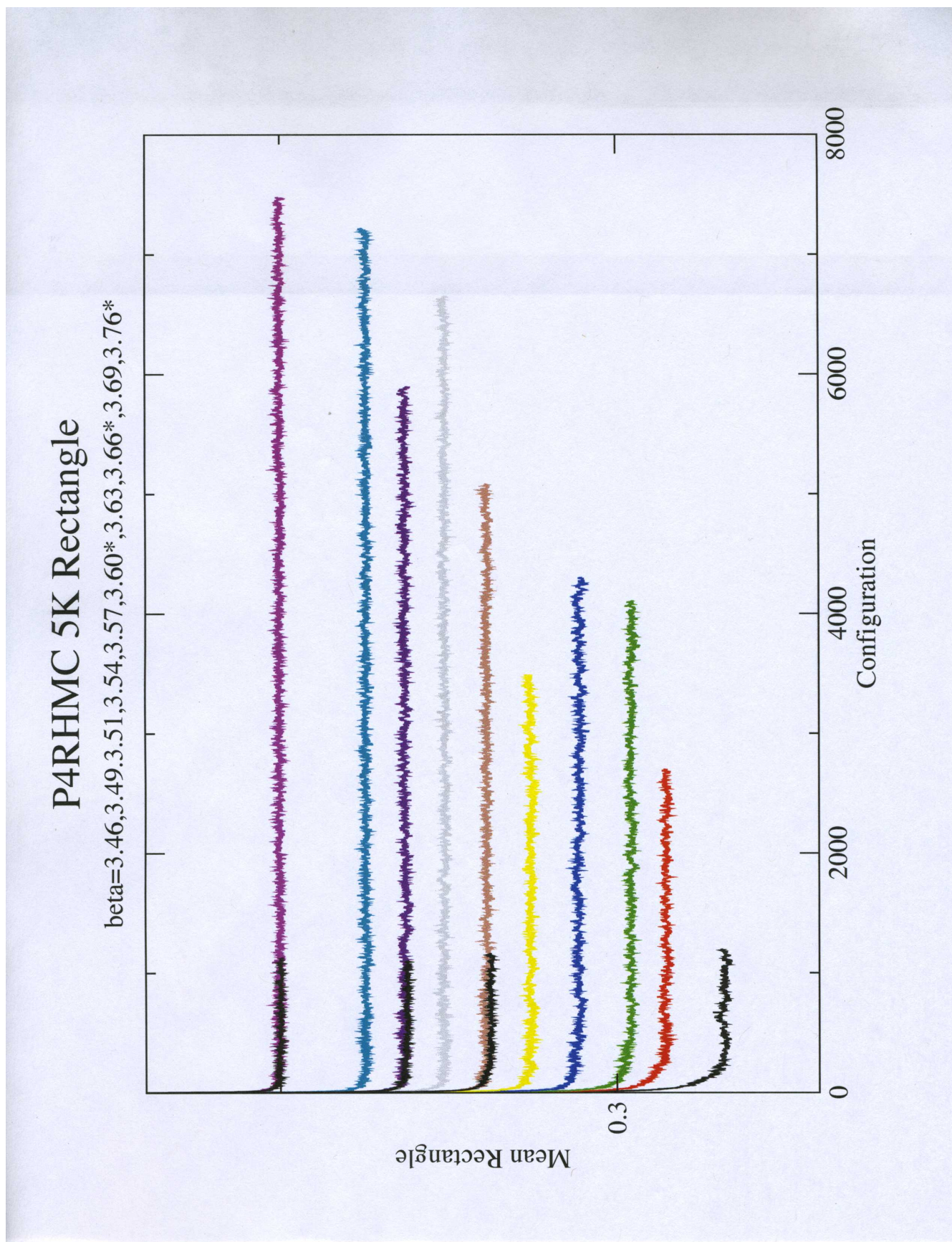
# MILC 5K Rectangle

beta = 6.458, 6.50, 6.55, 6.60, 6.65, 6.70, 6.76, 6.80, 6.85, 6.90, 6.95, 7.00, 7.08









# P4RHMC 5K delta H

beta=3.46,3.49,3.51,3.54,3.57,3.60\*,3.63,3.66\*,3.69,3.76\*

