Status of N_f=2 and 2+1+1 runs

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Outline

Run parameters

- All done on BG/P (all stopped now)
- Tree level Symanzik gauge action with β = 4.2

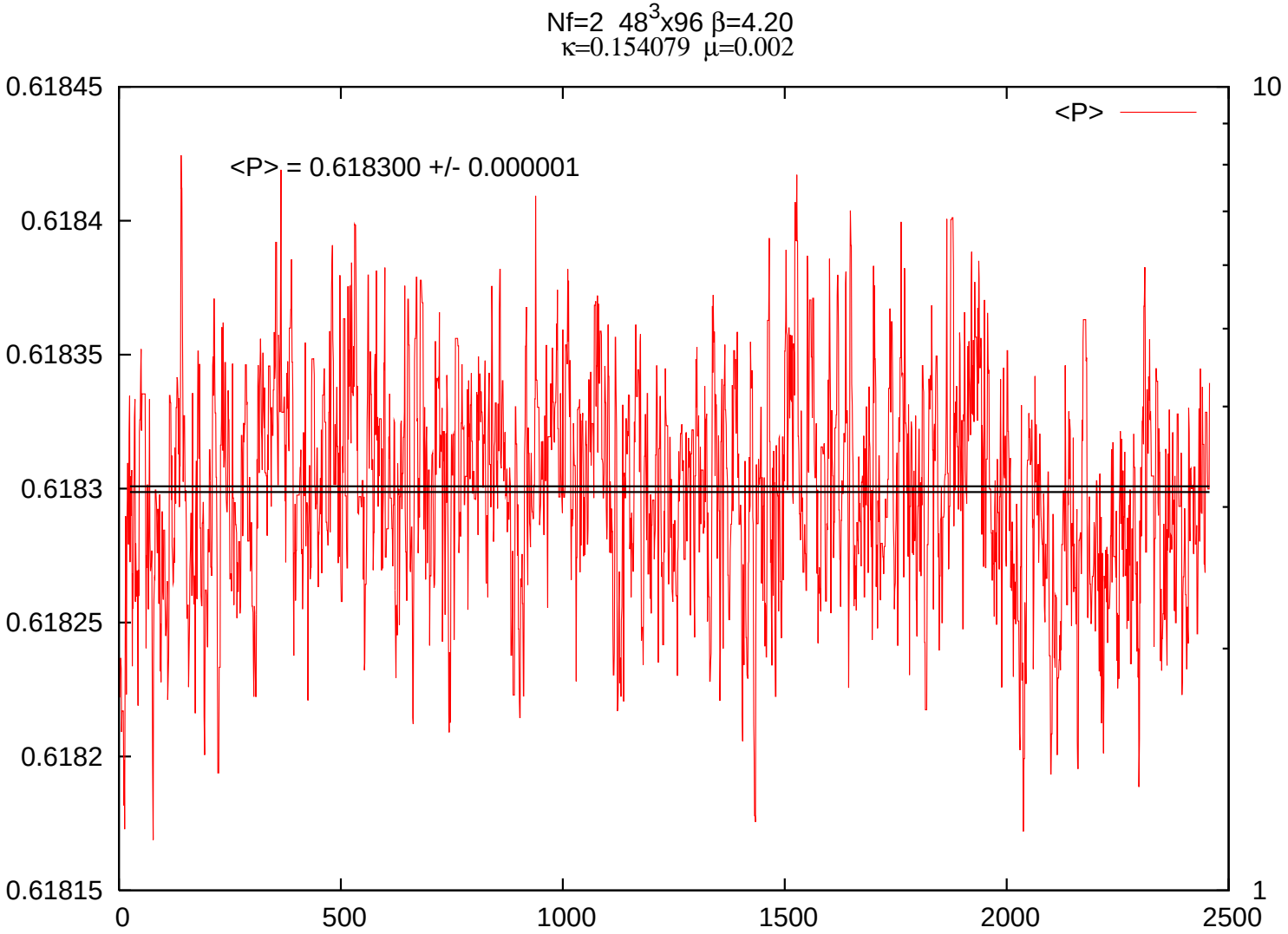
Ensemble	TxL^3	κ	μ	#traj
I	96x48^3	0.154079	0.002	2459
I'	96x48^3	0.154073	0.002	4703
II	64x32^3	0.154073	0.0065	6213
III	48x24^3	0.154073	0.002	6219

Measurements

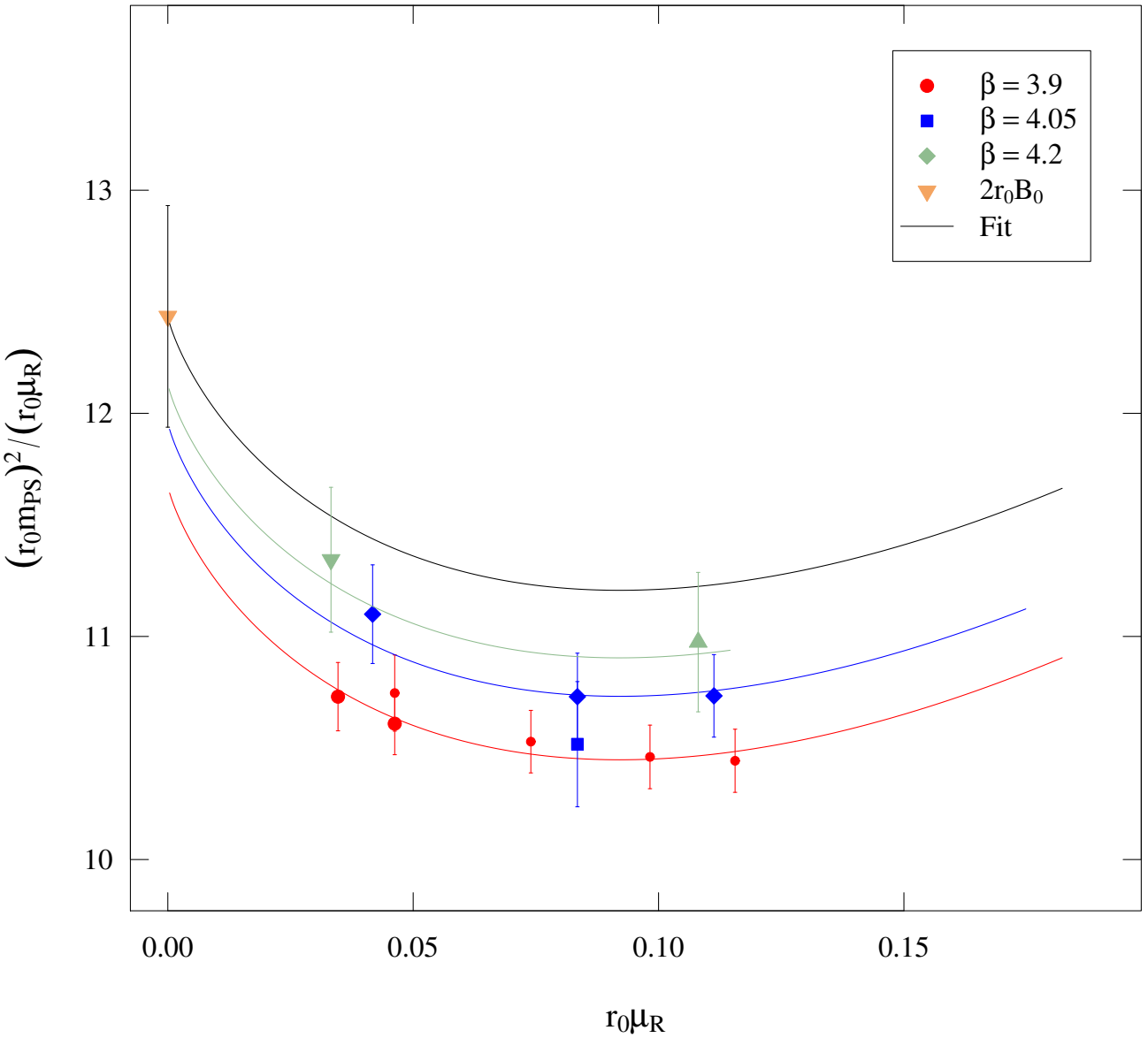
- Not with full statistics for some quantities
- Online/offline measurements

Ensemble	am_π	am_{PCAC}	af_π	m_N	r_0/a
I	0.0754(3)	0.00010(9)	0.0399(2)	?	8.486(122)
I'	0.0740(3)	0.00006(6)	0.0398(2)	0.306(4)	8.295(45)
II	0.1326(5)	-0.00032(11)	0.0465(3)	0.380(3)	7.986(37)
III	0.0933(43)	0.00001(13)	0.0258(13)	?	?

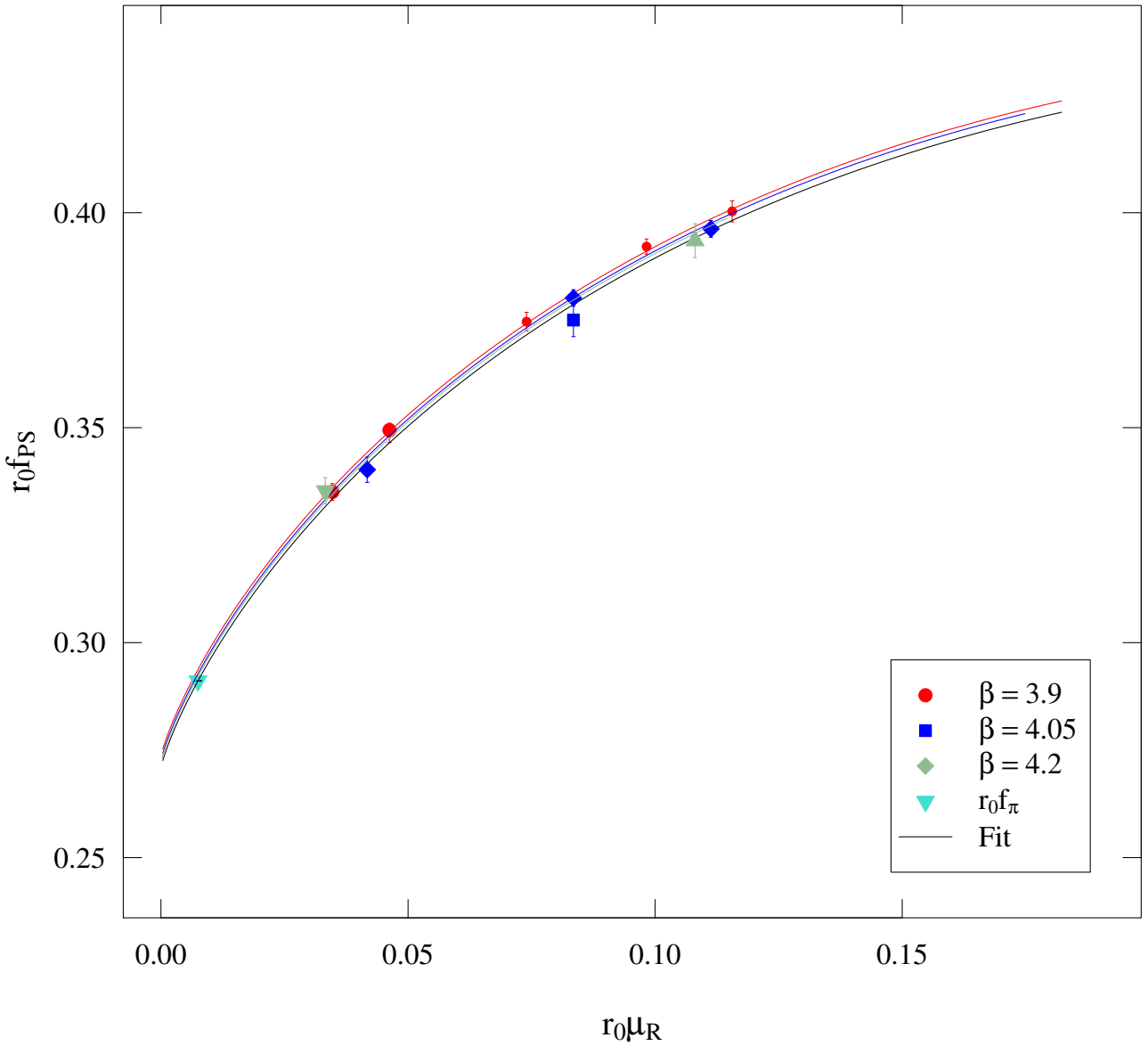
MC histories



Preliminary plot



Preliminary plot



Practical details

- Configurations will be put on the ILDG grid soon
- Propagators :
  - For baryons with APE+Gaussian smearing
  - For mesons with stochastic wall source (local, fuzzing, gaussian smearing)

Outline

Run parameters $\beta = 1.90$

- Iwasaki gauge action and κ tuned at each μ
- $\beta = 1.9$

TxL^3	κ	μ	μ_σ	μ_δ	status
48x20^3	0.163270	0.004	0.15	0.19	running
48x24^3	0.163270	0.004	0.15	0.19	stopped
48x24^3	0.163265	0.006	0.15	0.19	stopped
48x24^3	0.163260	0.008	0.15	0.19	stopped
48x24^3	0.163255	0.010	0.15	0.19	stopped
64x32^3	0.163272	0.003	0.15	0.19	running
64x32^3	0.163270	0.004	0.15	0.19	stopped
64x32^3	0.163267	0.005	0.15	0.19	running

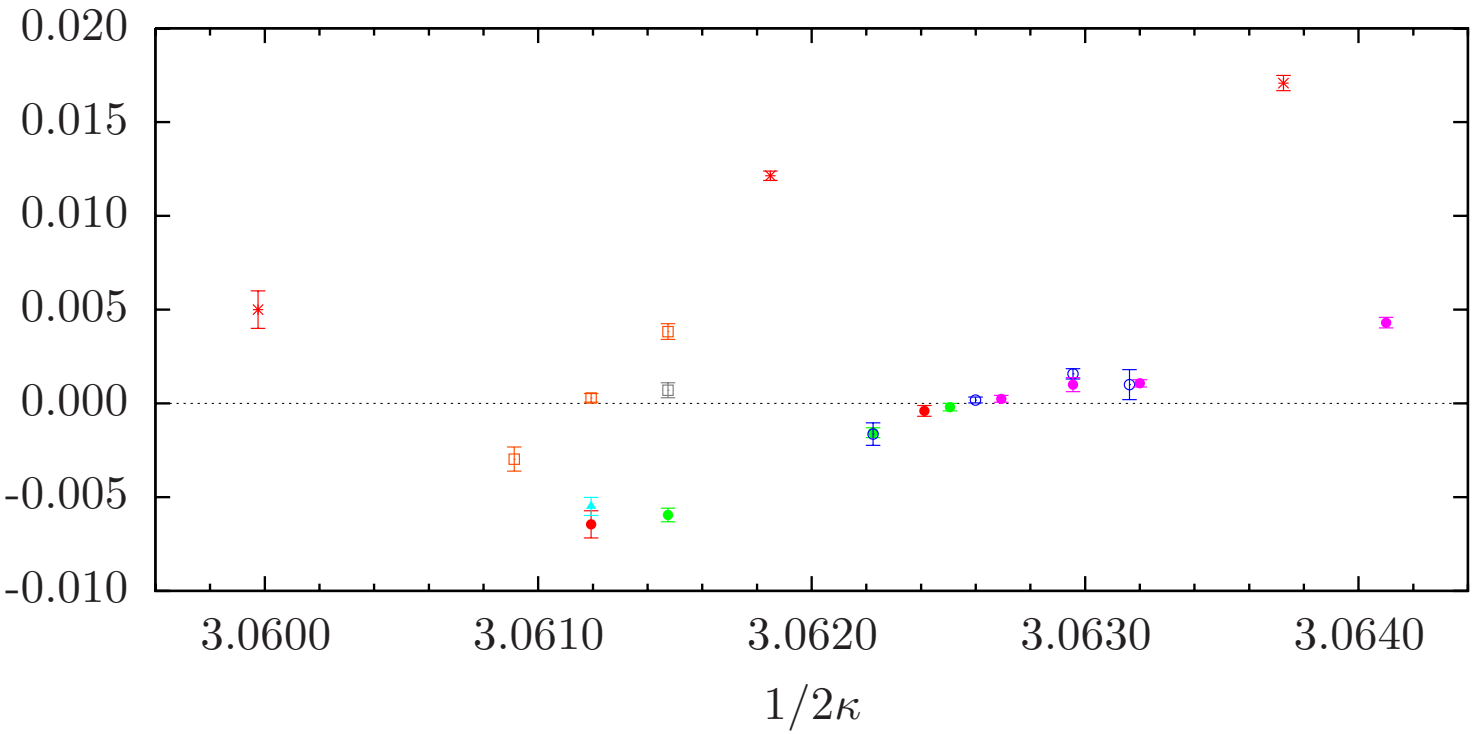
- 2 sets at $L = 24$ $\mu = 0.004$

Run parameters $\beta = 1.95$

- $\beta = 1.95$

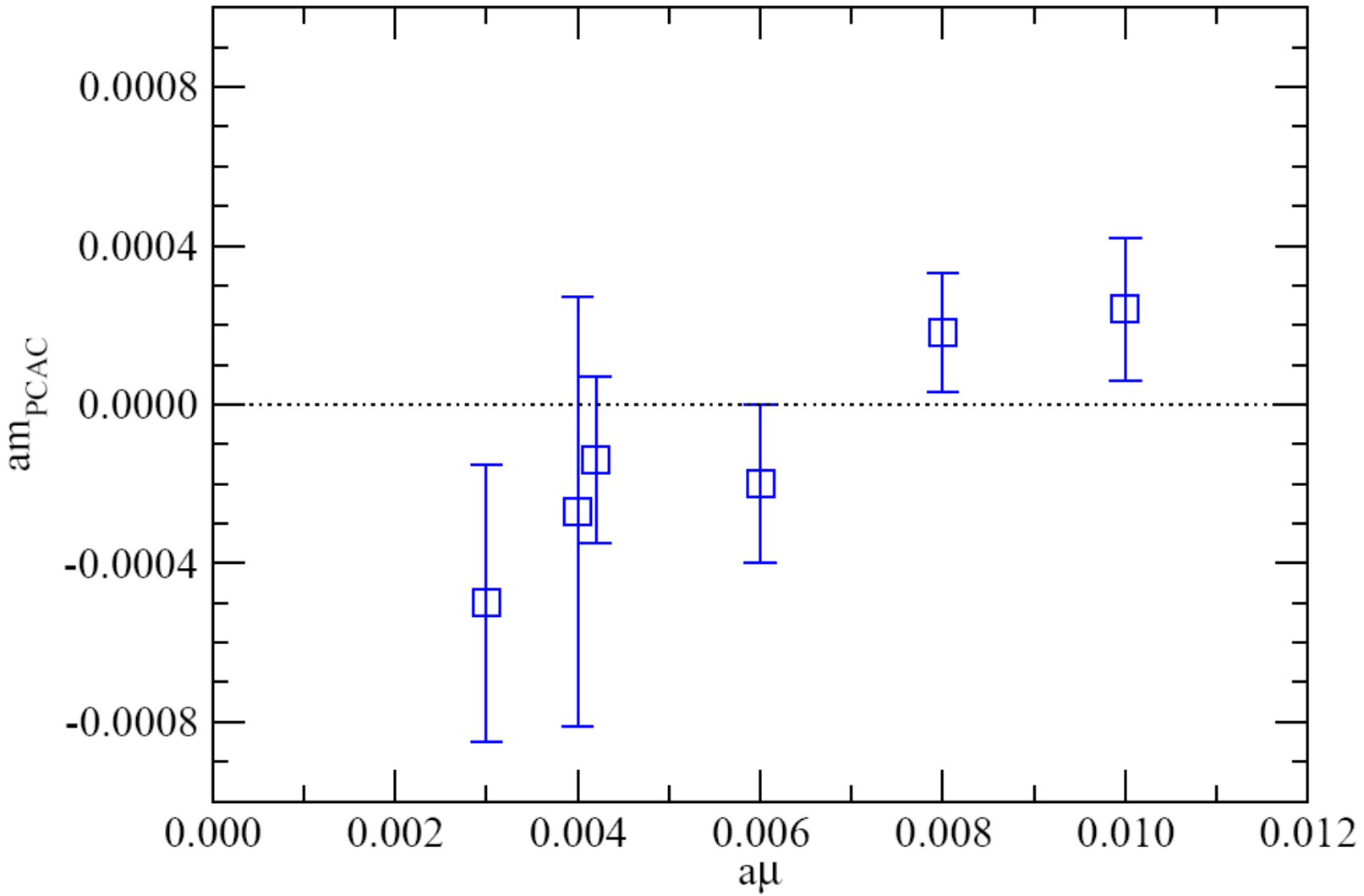
TxL^3	κ	μ	μ_σ	μ_δ	status
64x32^3	0.161240	0.0035	0.135	0.17	stopped
64x32^3	0.161236	0.0055	0.135	0.17	stopped
64x32^3	0.161232	0.0075	0.135	0.17	running
48x24^3	0.1612312	0.0085	0.135	0.17	running

Tuning summary

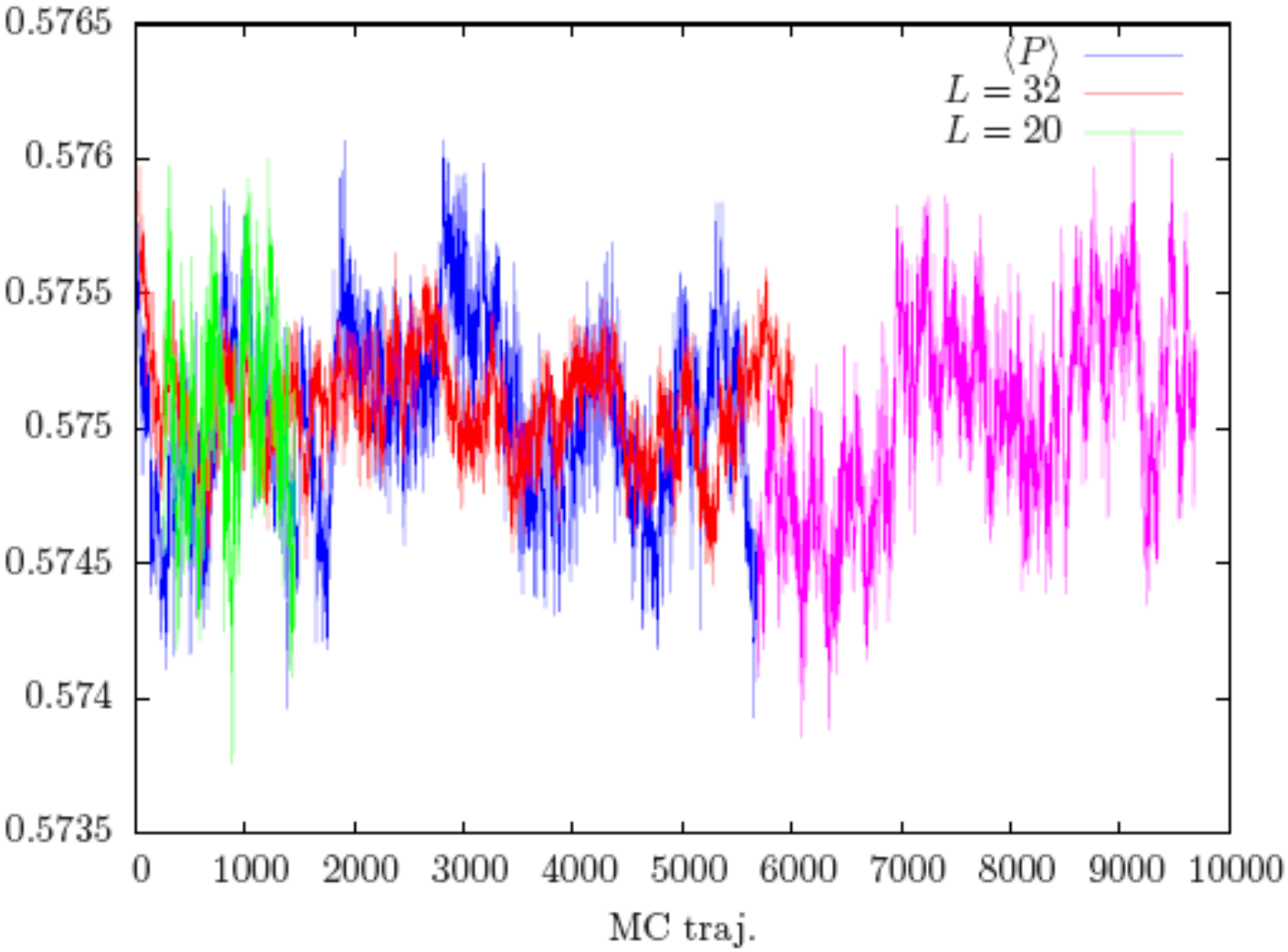


$\beta = 1.90 \quad \mu = 0.0040 \quad \mu_\sigma = 0.110 \quad \mu_\delta = 0.090$
$\beta = 1.90 \quad \mu = 0.0040 \quad \mu_\sigma = 0.110 \quad \mu_\delta = 0.120$
$\beta = 1.90 \quad \mu = 0.0060 \quad \mu_\sigma = 0.110 \quad \mu_\delta = 0.120$
$\beta = 1.90 \quad \mu = 0.0040 \quad \mu_\sigma = 0.150 \quad \mu_\delta = 0.190$
$\beta = 1.90 \quad \mu = 0.0060 \quad \mu_\sigma = 0.150 \quad \mu_\delta = 0.190$
$\beta = 1.90 \quad \mu = 0.0080 \quad \mu_\sigma = 0.150 \quad \mu_\delta = 0.190$
$\beta = 1.90 \quad \mu = 0.0100 \quad \mu_\sigma = 0.150 \quad \mu_\delta = 0.190$
$\beta = 1.90 \quad \mu = 0.0040 \quad \mu_\sigma = 0.185 \quad \mu_\delta = 0.236$

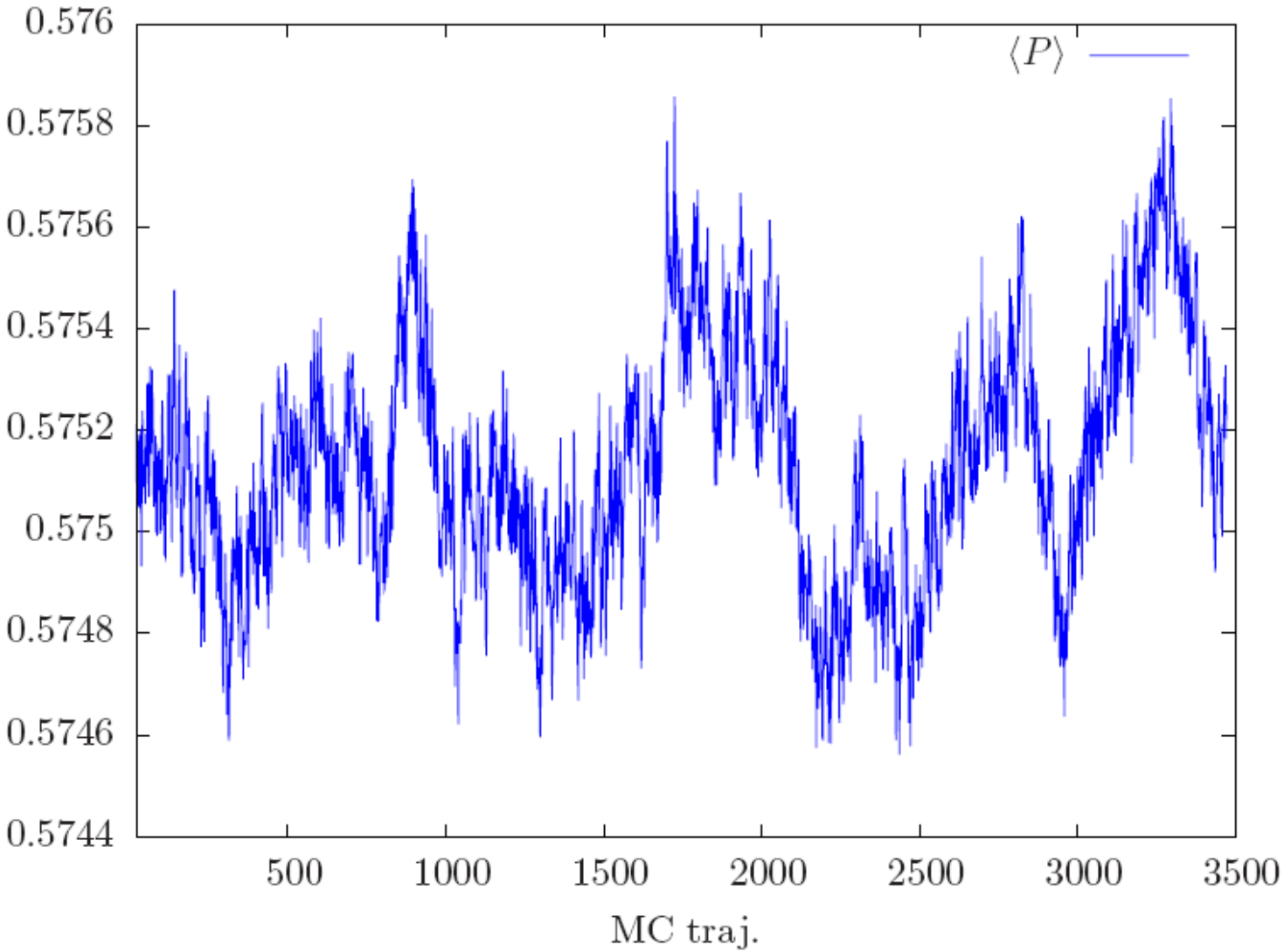
Tuning summary $\beta = 1.90$



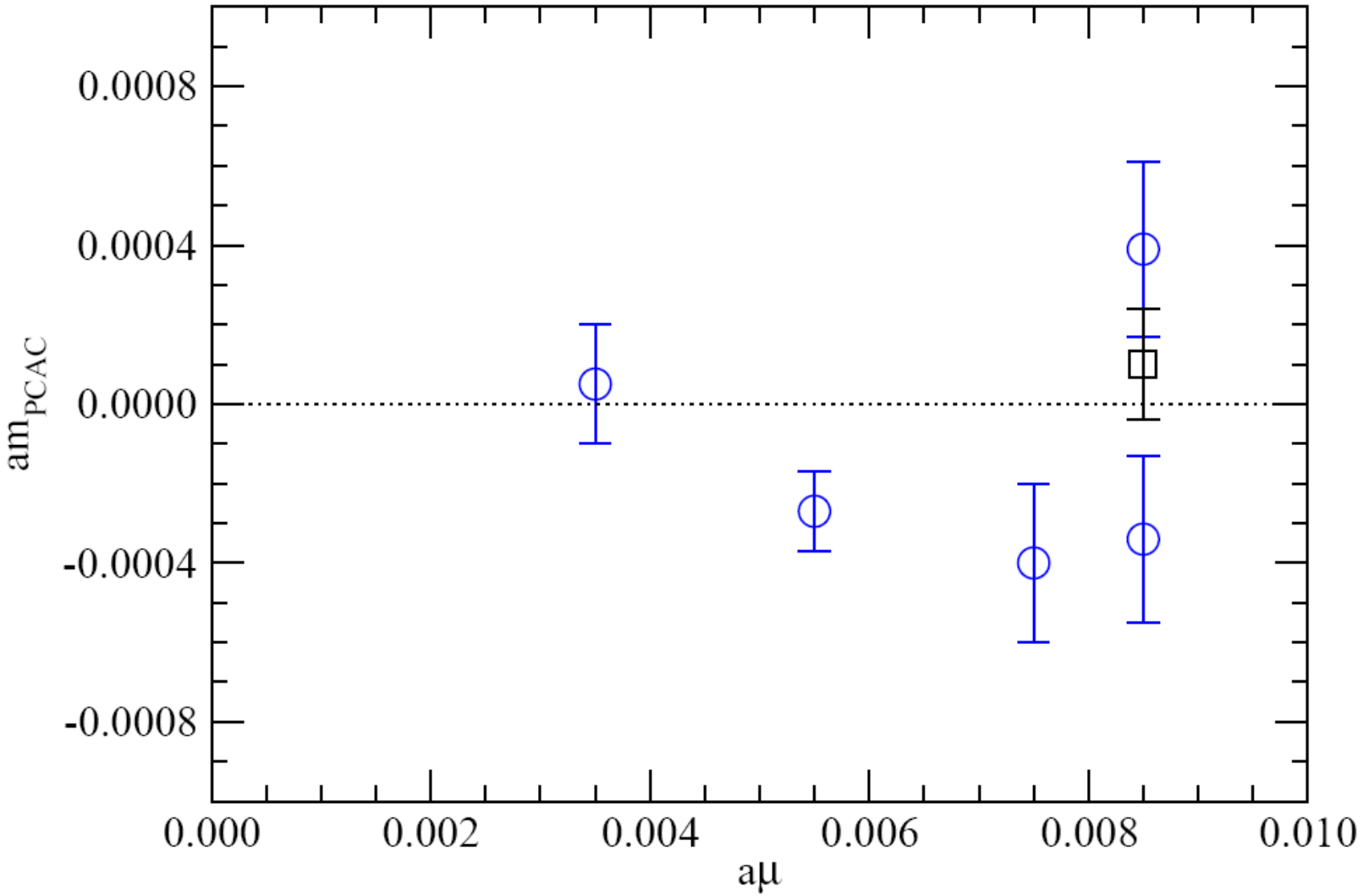
MC histories $\beta = 1.90$, $L = 24$, $\mu = 0.004$



MC histories $\beta = 1.90$, $L = 32$, $\mu = 0.003$



Tuning summary $\beta = 1.95$



Measurements

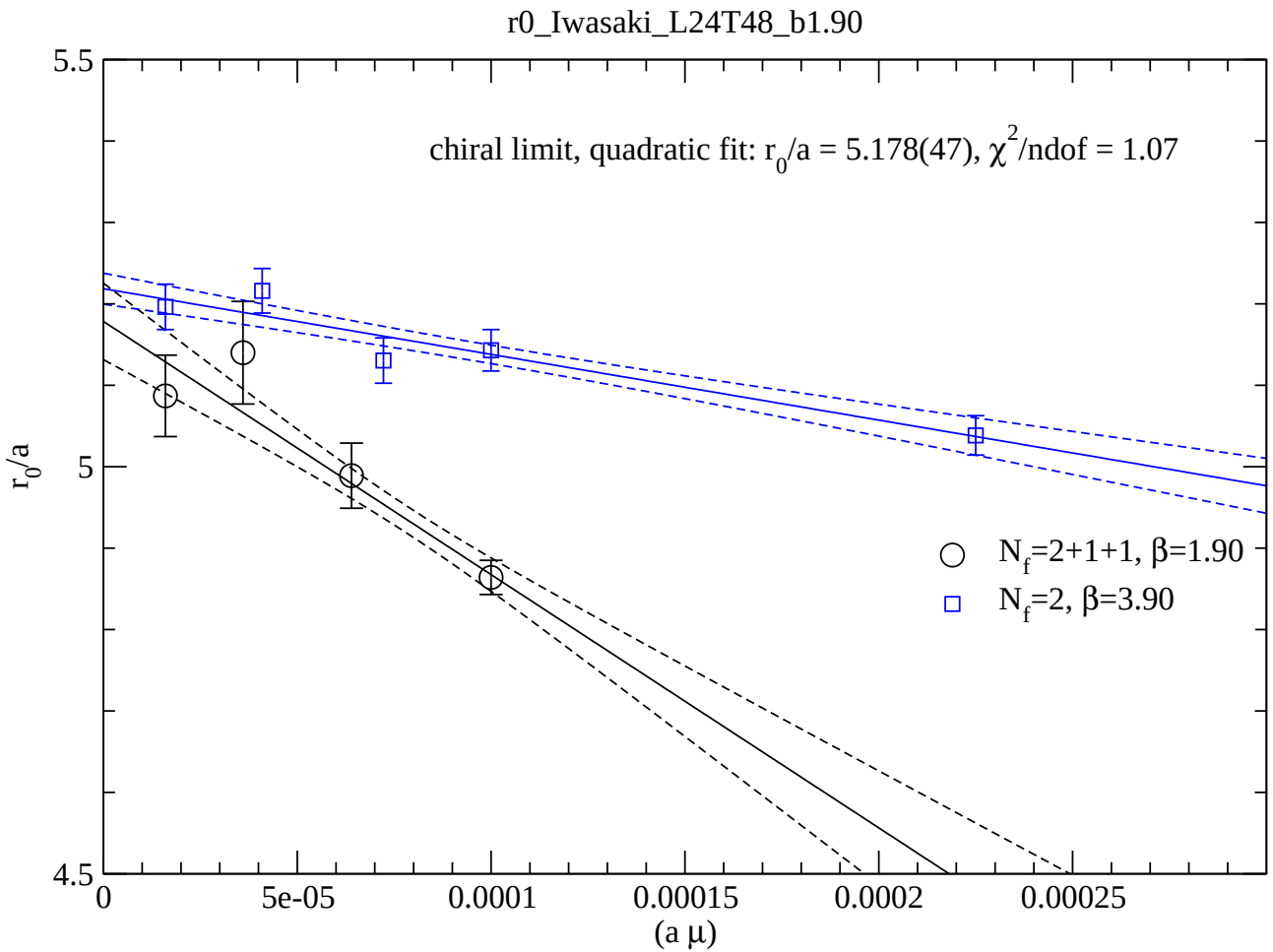
- Not with full statistics for some quantities (see Albert's talk)
- Online/offline measurements

$$\beta = 1.9,\ 24^3\text{x}48$$

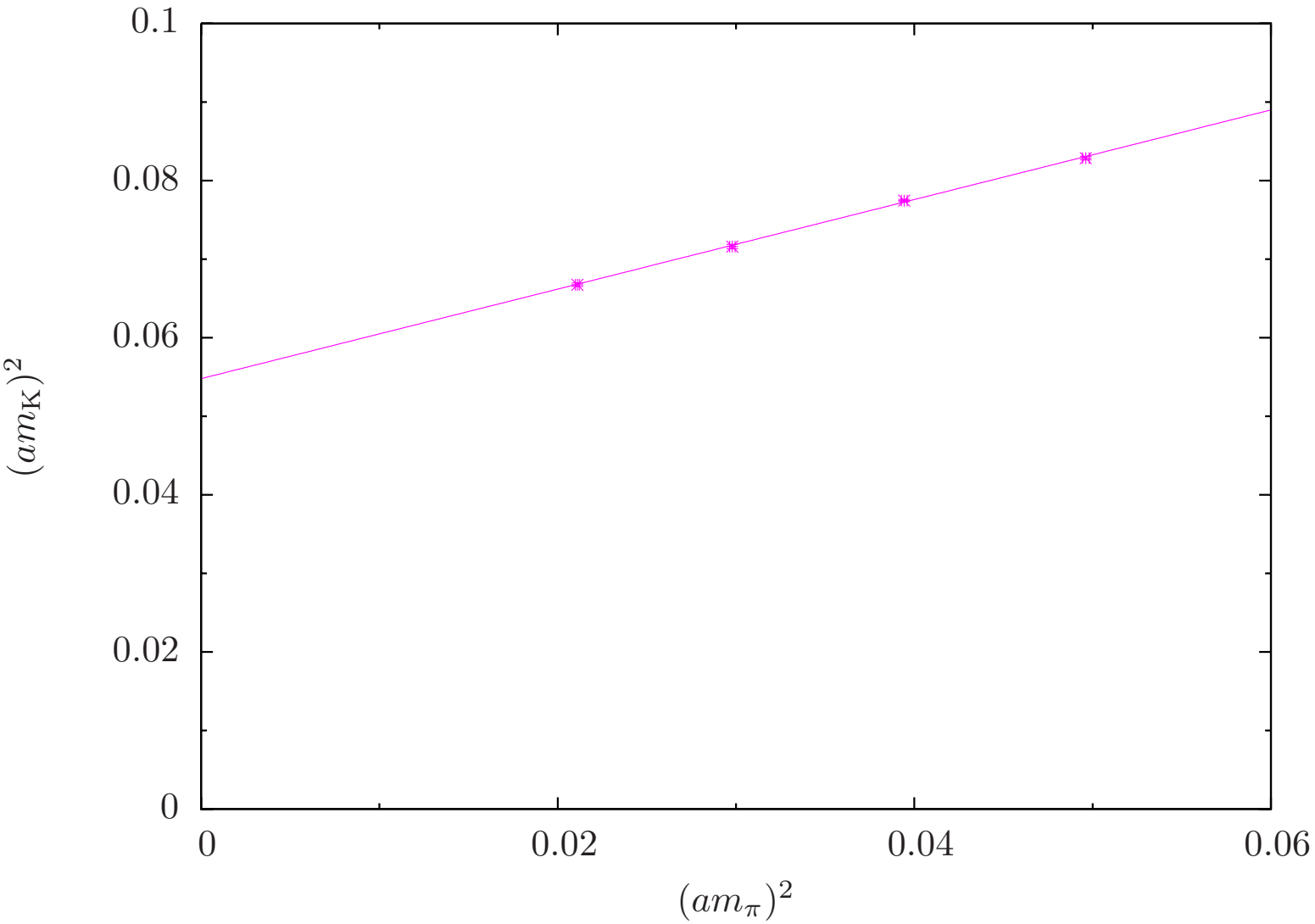
μ	am_π	af_π	m_N	r_0/a	m_K
0.004	0.145266(387)	0.0654(3)	0.540(6)	5.178(44)	0.25836(46)
0.006	0.172613(436)	0.0717(2)	0.569(7)	5.209(58)	0.26757(54)
0.008	0.198583(413)	0.0762(2)	0.592(7)	4.989(40)	0.27832(29)
0.010	0.222755(406)	0.0792(2)	0.623(6)	4.864(21)	0.28786(39)

- Other numbers on the wiki

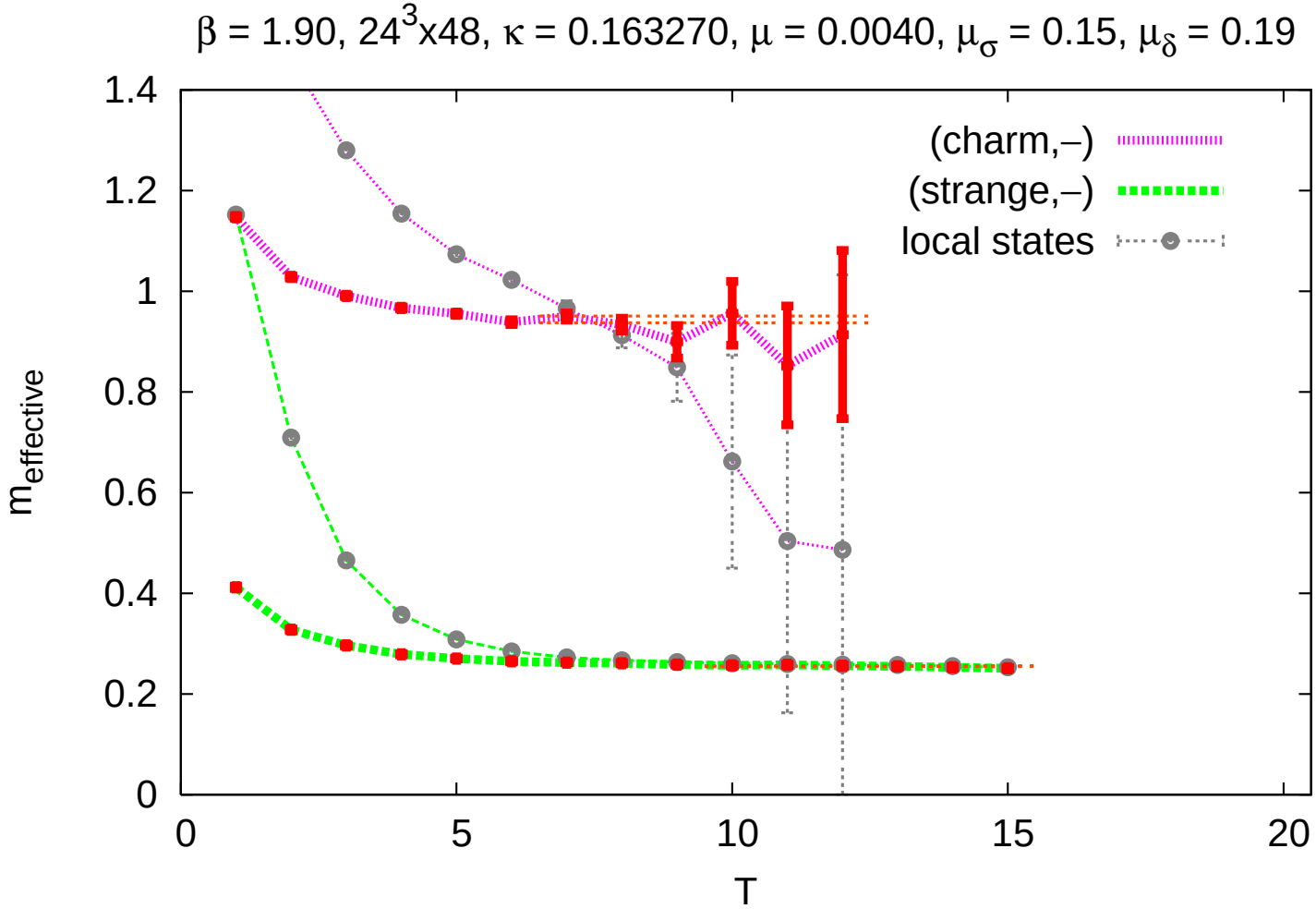
r_0 plot


r0_Iwasaki_L24T48_b1.90
chiral limit, quadratic fit: r0/a = 5.178(47), χ2/ndof = 1.07
Nf=2+1+1, β=1.90
Nf=2, β=3.90
r0/a
(a μ)
5.5
5
4.5
0
5e-05
0.0001
0.00015
0.0002
0.00025

Heavy/light sector

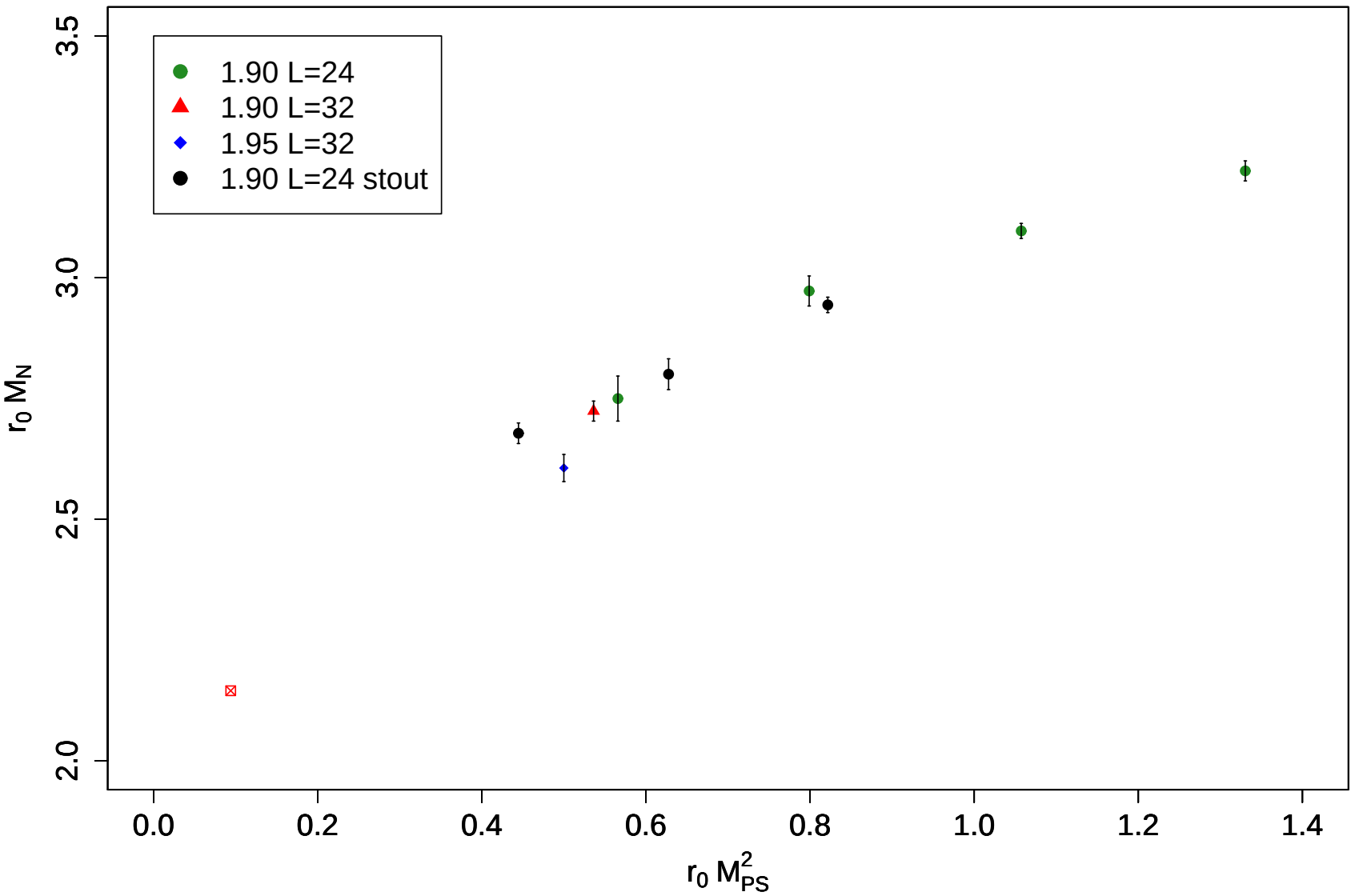


Gaussian smearing heavy/light sector



- Plateau improvement
- D-meson mass issue (Marc's note on wiki, Istvan's talk)

Nucleon


1.90 L=24
1.90 L=32
1.95 L=32
1.90 L=24 stout
$r_0 M_N$
$r_0 M_{PS}^2$
2.0
2.5
3.0
3.5
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4

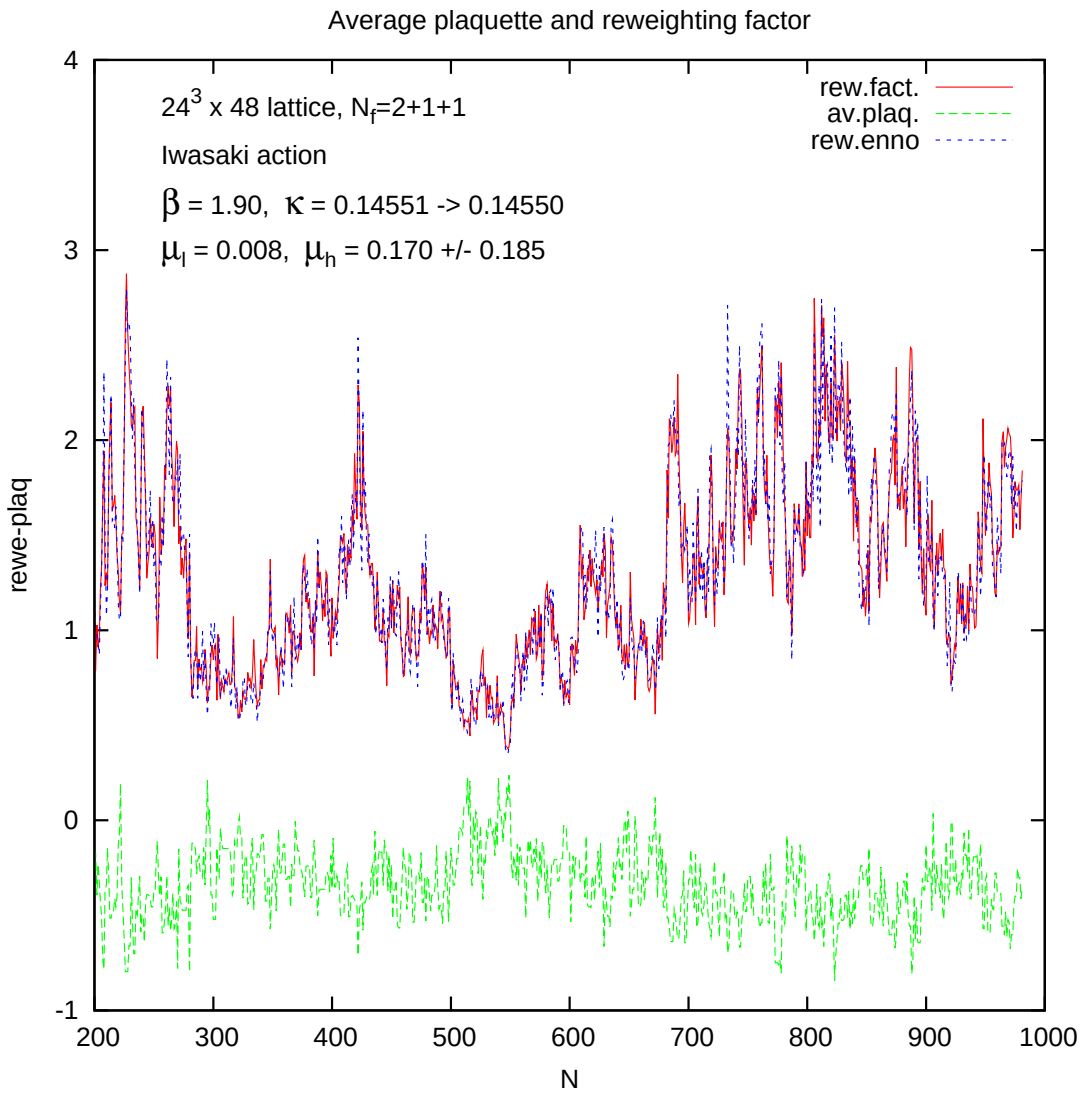
Stout runs parameters

- 1 level of stout smearing with $\rho = 0.15$

TxL^3	κ	μ	μ_σ	μ_δ	status
48x24^3	0.145512	0.004	0.17	0.185	stopped
48x24^3	0.145511	0.006	0.17	0.185	stopped
48x24^3	0.145510	0.008	0.17	0.185	stopped

- See Istvan's talk

Reweigthing



Practical details

Check the wiki for latest details

- All $\beta = 1.9$ $L = 24$ on the ILDG grid (except 2nd set at $\mu = 0.004$)
- All propagators (light and heavy sector) have been stored
  - For baryons with APE+Gaussian smearing
  - For mesons with stochastic wall source (local, fuzzing, gaussian smearing)
- Correlators can be provided as well

Conclusion

- $N_f = 4$ run on MareNostrum at $\beta = 1.9$, 24^3x48, $\mu = 0.008$
- Run at $\beta = 1.9$, 24^3x48, $\mu = 0.01$, $\kappa = 0.163255$, $\mu_\sigma = 0.15$, $\mu_\delta = 0.197$
- New $N_f = 2 + 1 + 1$ run started (Philippe on BG/P)

β	TxL^3	κ	μ	μ_σ	μ_δ
2.1	96x48^3	0.1575	0.002	0.120	0.135

- Gregorio and Albert talks for more on analysis, chiral fits

- Pion isospin breaking (both stout/non stout) (Chris)
- Long autocorrelation time for some runs