

# tmLQCD HMC profile

2021-09-23

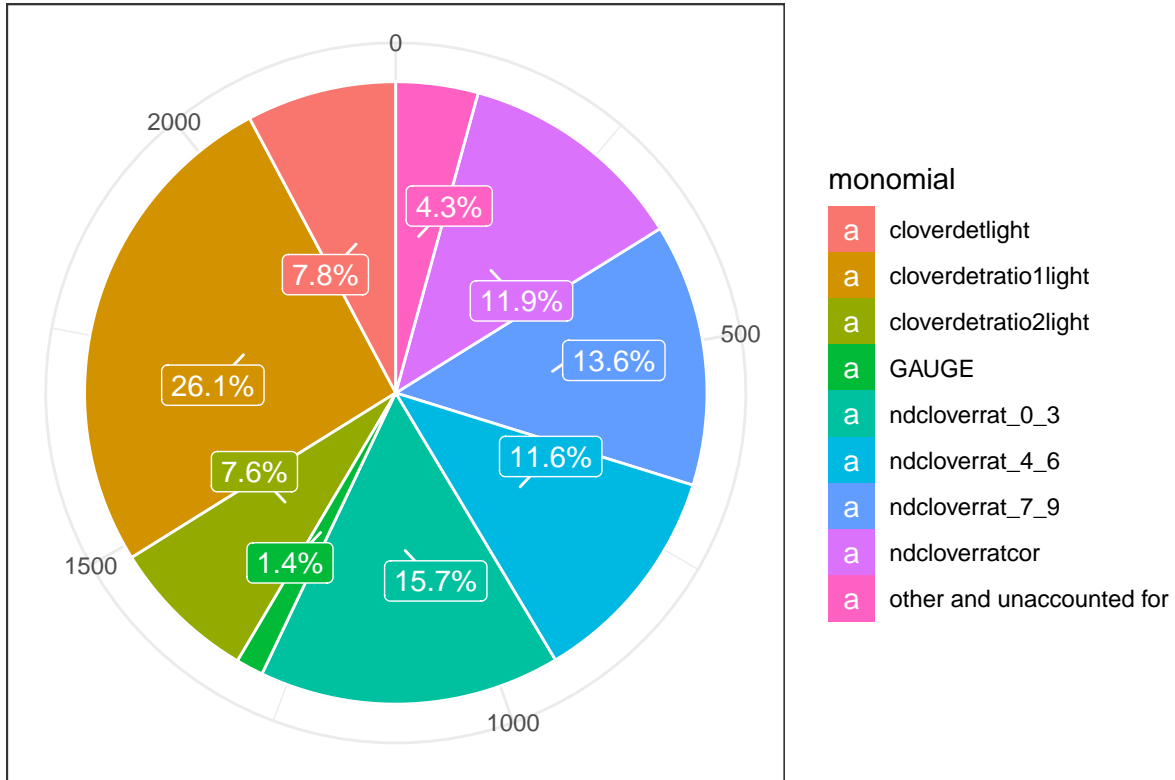
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Table 1: Total time per monomial. Percentages are w.r.t. to the total time of 2244.6 seconds.

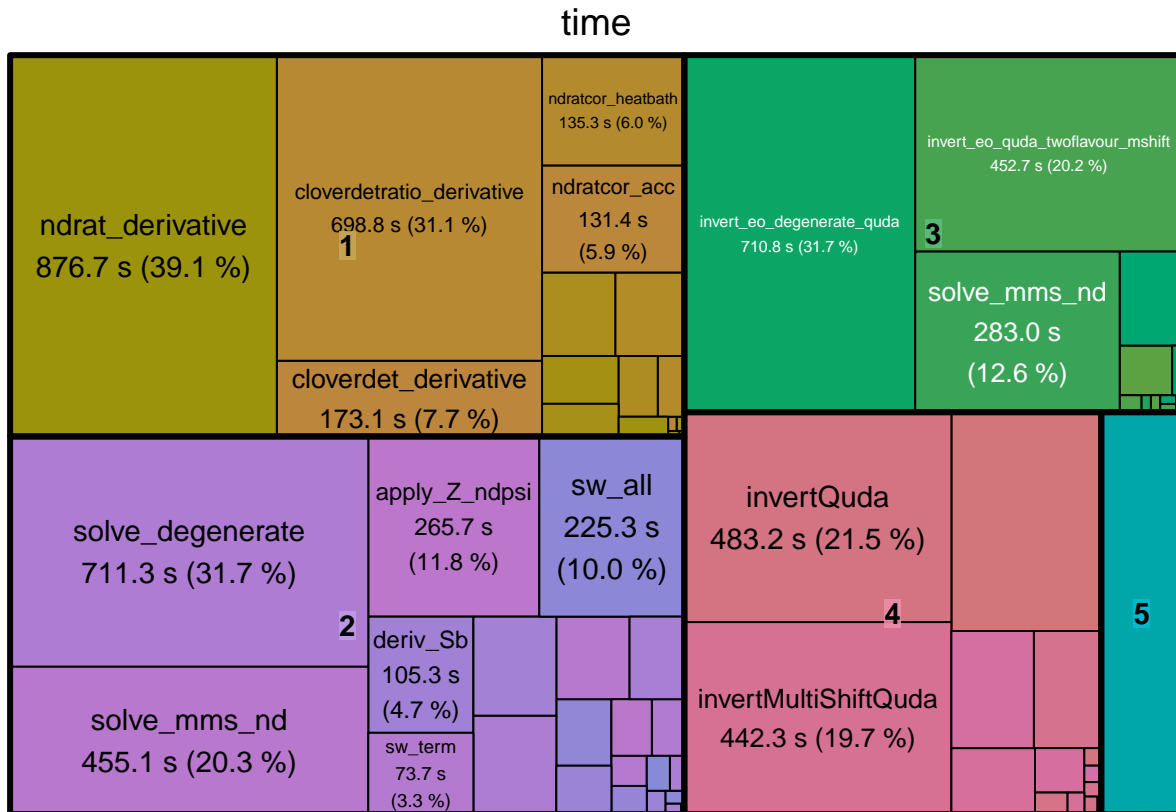
monomial	time	prop
cloverdetratio1light	585.6	26.1
ndcloverrat_0_3	351.4	15.7
ndcloverrat_7_9	306.3	13.6
ndcloverratcor	266.7	11.9
ndcloverrat_4_6	261.0	11.6
cloverdetlight	174.7	7.8
cloverdetratio2light	171.4	7.6
GAUGE	31.8	1.4
other and unaccounted for	95.8	4.3

### Total time per monomial

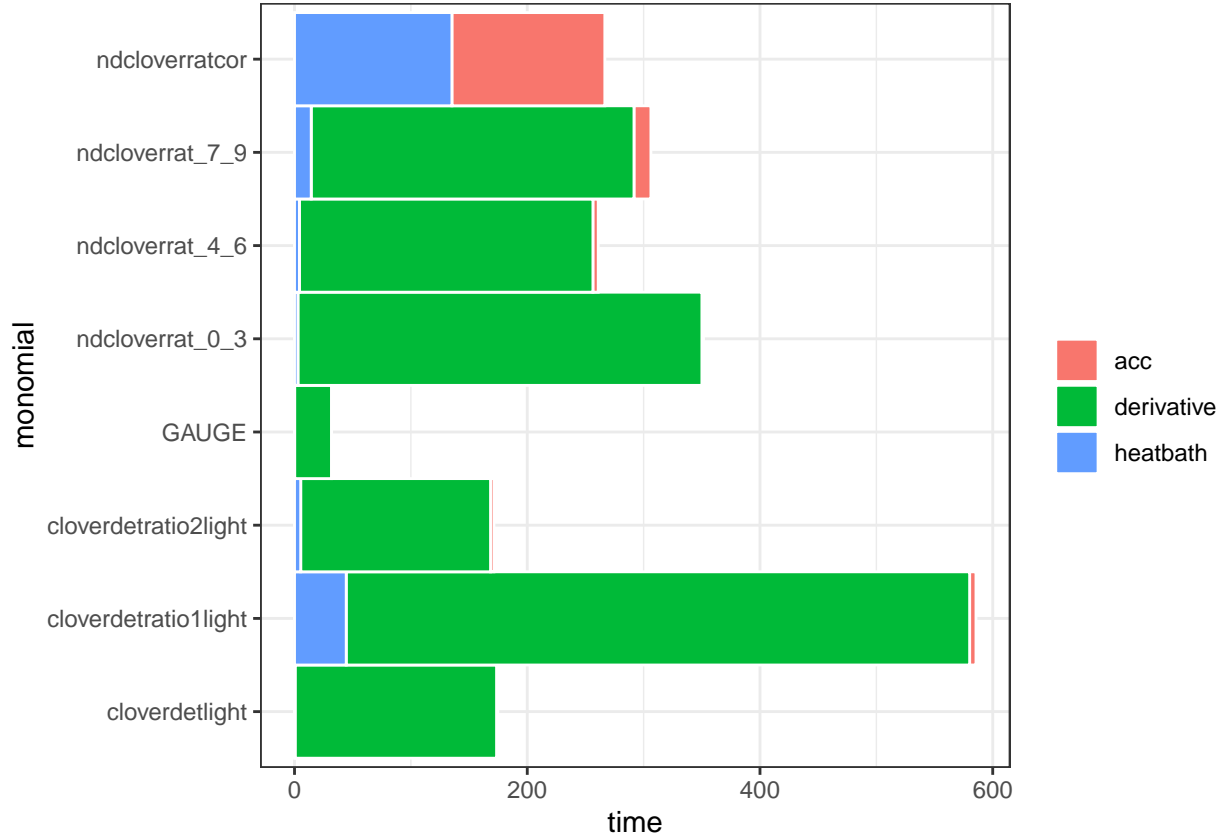


## Hotspots by level

The total time spent in the benchmark was 2244.593 seconds. All percentages in the plot below are with respect to this total time.



## Time by type and monomial



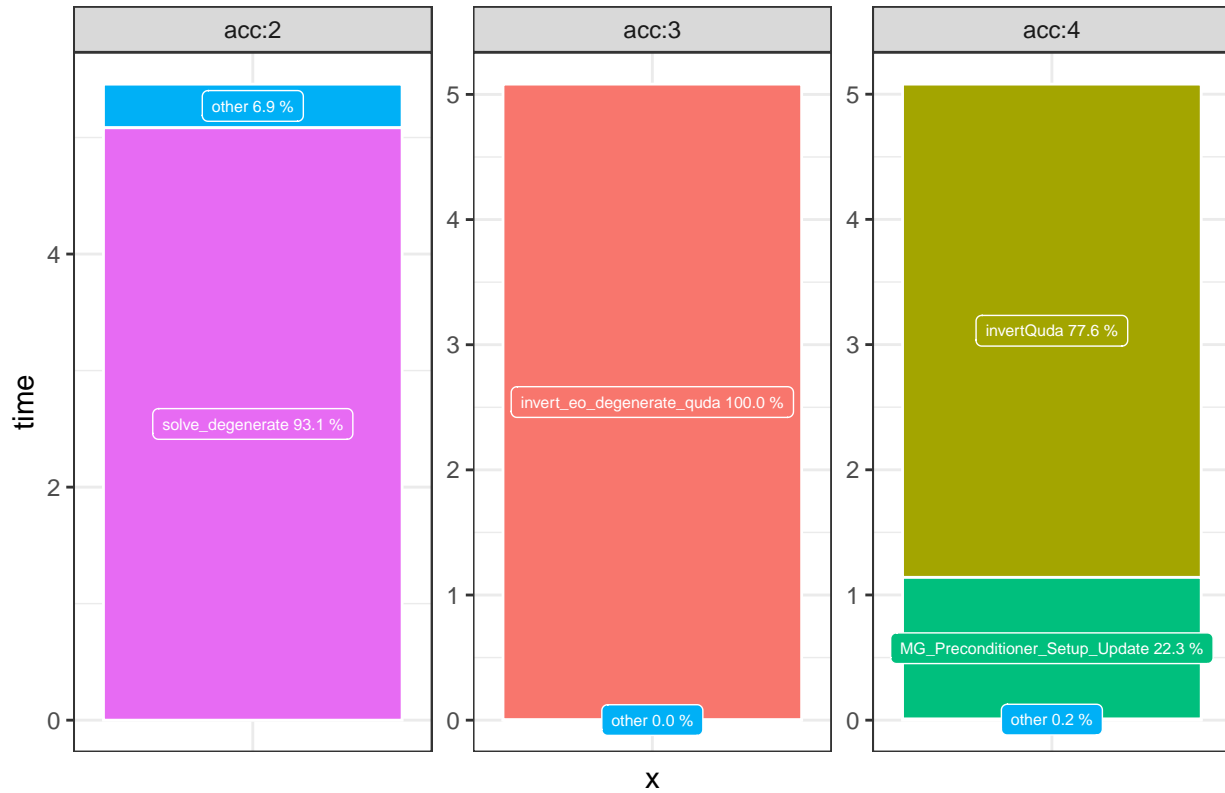
monomial	type	time	prop
cloverdetlight	acc	1.0	0.6
cloverdetlight	derivative	173.1	99.1
cloverdetlight	heatbath	0.5	0.3
cloverdetratio1light	acc	5.5	0.9
cloverdetratio1light	derivative	535.7	91.5
cloverdetratio1light	heatbath	44.4	7.6
cloverdetratio2light	acc	2.9	1.7
cloverdetratio2light	derivative	163.1	95.2
cloverdetratio2light	heatbath	5.3	3.1
GAUGE	acc	0.1	0.4
GAUGE	derivative	31.6	99.2
GAUGE	heatbath	0.1	0.4
ndcloverrat_0_3	acc	1.3	0.4
ndcloverrat_0_3	derivative	347.1	98.8
ndcloverrat_0_3	heatbath	3.0	0.8
ndcloverrat_4_6	acc	4.6	1.8
ndcloverrat_4_6	derivative	252.2	96.6
ndcloverrat_4_6	heatbath	4.2	1.6
ndcloverrat_7_9	acc	14.6	4.8
ndcloverrat_7_9	derivative	277.4	90.6
ndcloverrat_7_9	heatbath	14.4	4.7
ndcloverratcor	acc	131.4	49.3
ndcloverratcor	heatbath	135.3	50.7

## Details by monomial and type

In the tables below, all percentages are given with respect to the given level. The monomials are ordered according to their contribution to the total time.

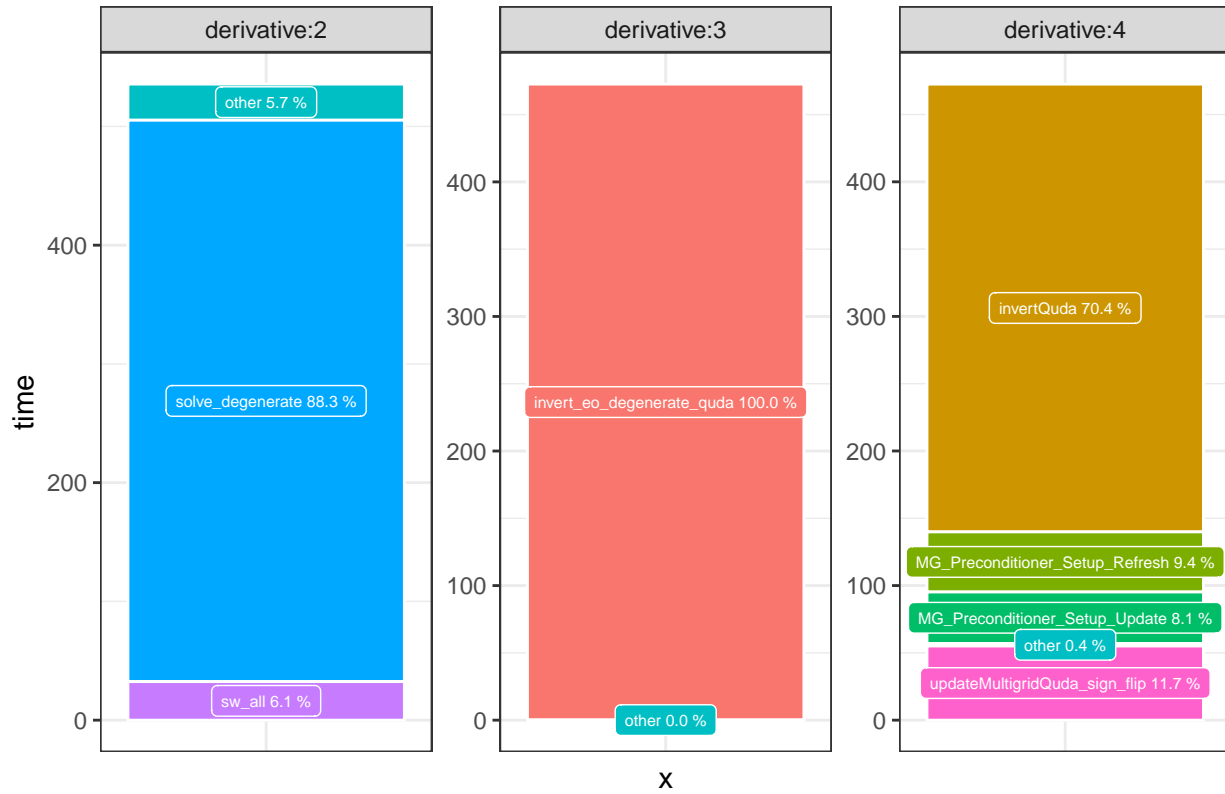
### cloverdetratio1light

#### cloverdetratio1light acc



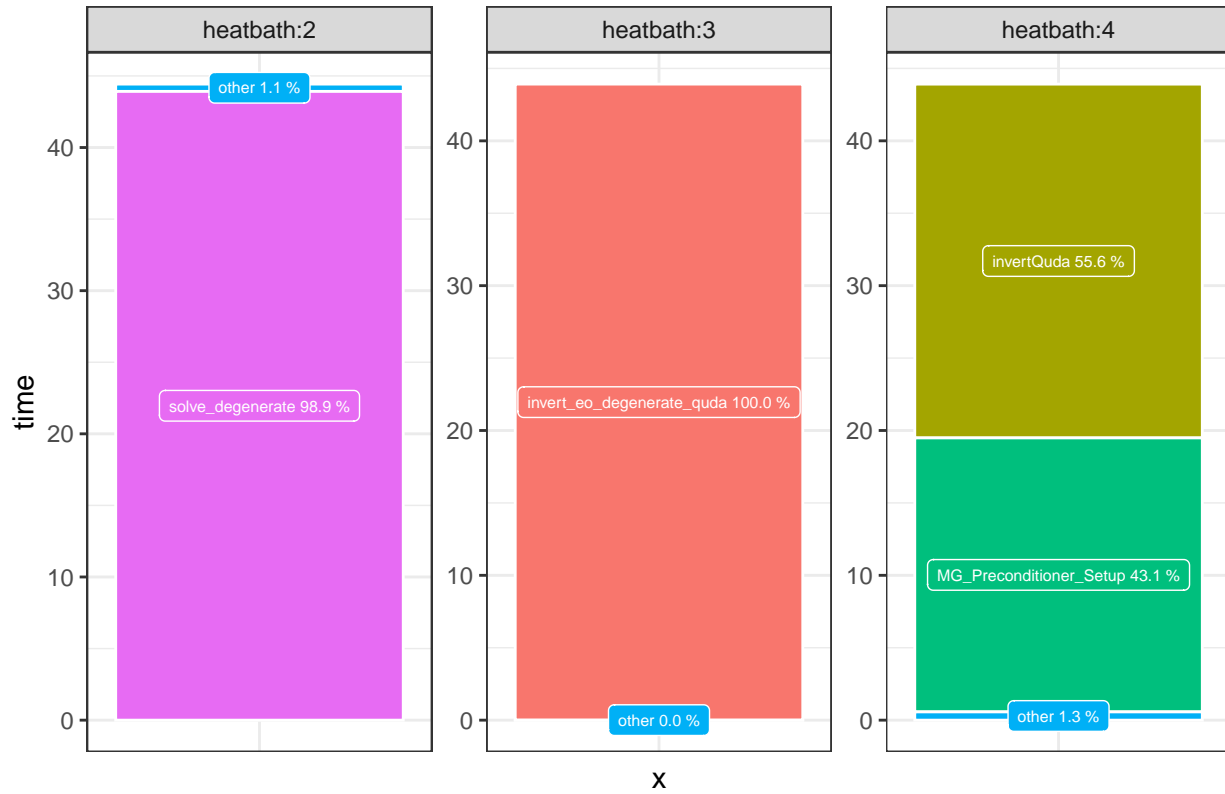
level	name	time	prop
2	other	0.4	6.9
2	solve_degenerate	5.1	93.1
3	invert_eo_degenerate_quda	5.1	100.0
3	other	0.0	0.0
4	invertQuda	3.9	77.6
4	MG_Preconditioner_Setup_Update	1.1	22.3
4	other	0.0	0.2

# cloverdetratio1light derivative



level	name	time	prop
2	other	30.4	5.7
2	solve_degenerate	472.8	88.3
2	sw_all	32.5	6.1
3	invert_eo_degenerate_quda	472.6	100.0
3	other	0.1	0.0
4	invertQuda	332.7	70.4
4	MG_Preconditioner_Setup_Refresh	44.6	9.4
4	MG_Preconditioner_Setup_Update	38.3	8.1
4	other	1.8	0.4
4	updateMultigridQuda_sign_flip	55.1	11.7

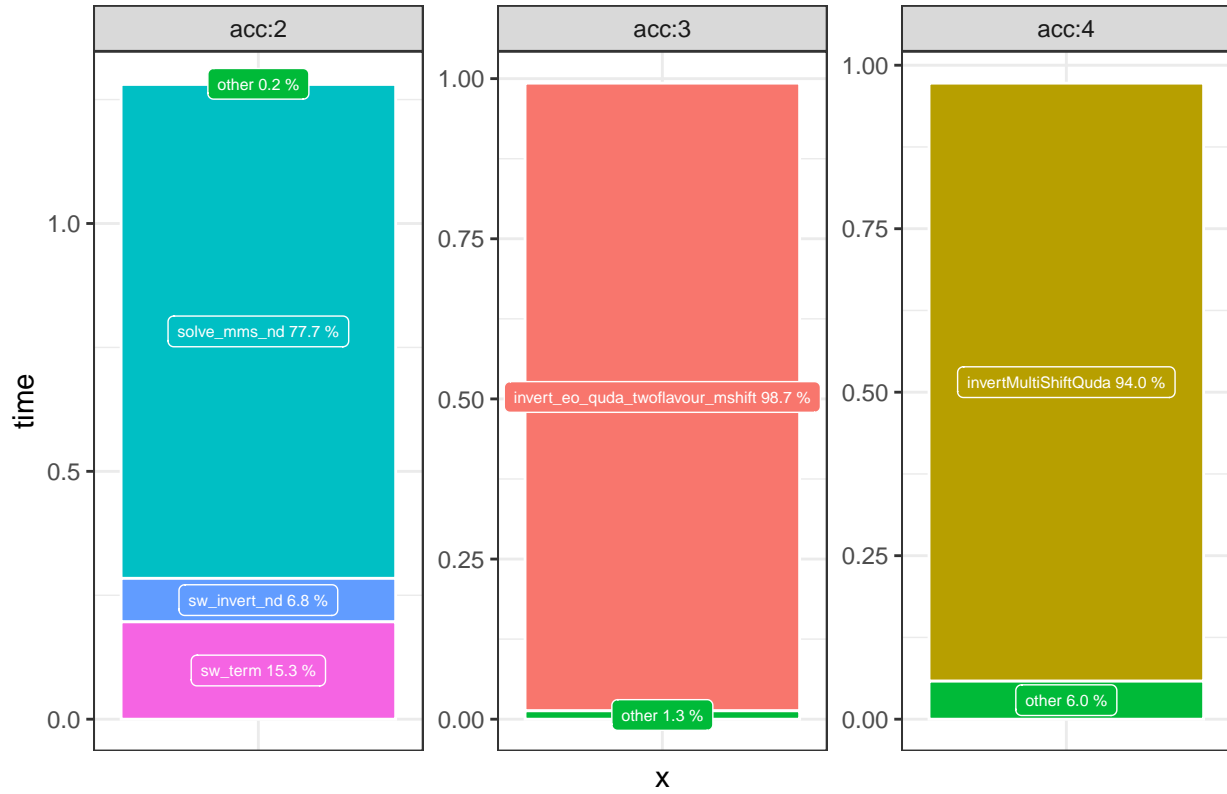
# cloverdetratio1light heatbath



level	name	time	prop
2	other	0.5	1.1
2	solve_degenerate	43.9	98.9
3	invert_eo_degenerate_quda	43.9	100.0
3	other	0.0	0.0
4	invertQuda	24.4	55.6
4	MG_Preconditioner_Setup	18.9	43.1
4	other	0.6	1.3

ndcloverrat\_0\_3

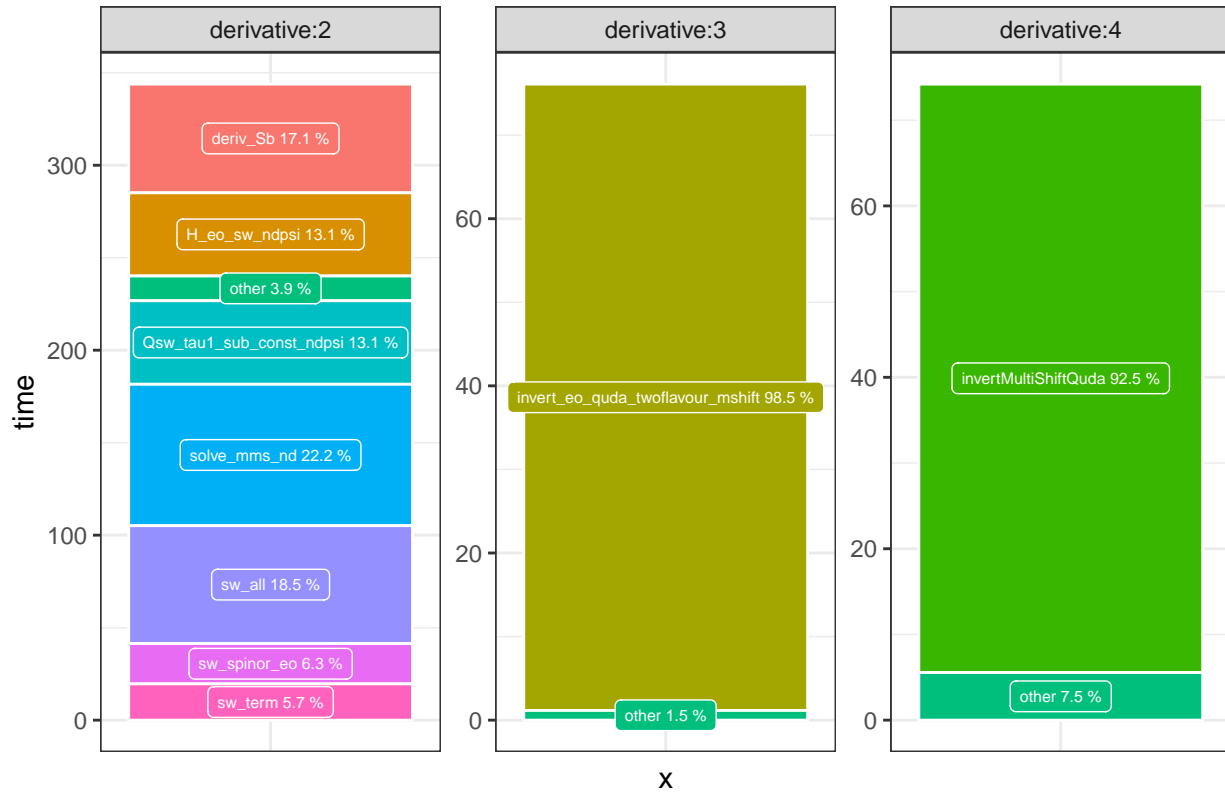
ndcloverrat\_0\_3 acc



level	name	time	prop
2	other	0.0	0.2
2	solve_mms_nd	1.0	77.7
2	sw_invert_nd	0.1	6.8
2	sw_term	0.2	15.3
3	invert_eo_quda_twoflavour_mshift	1.0	98.7
3	other	0.0	1.3
4	invertMultiShiftQuda	0.9	94.0
4	other	0.1	6.0

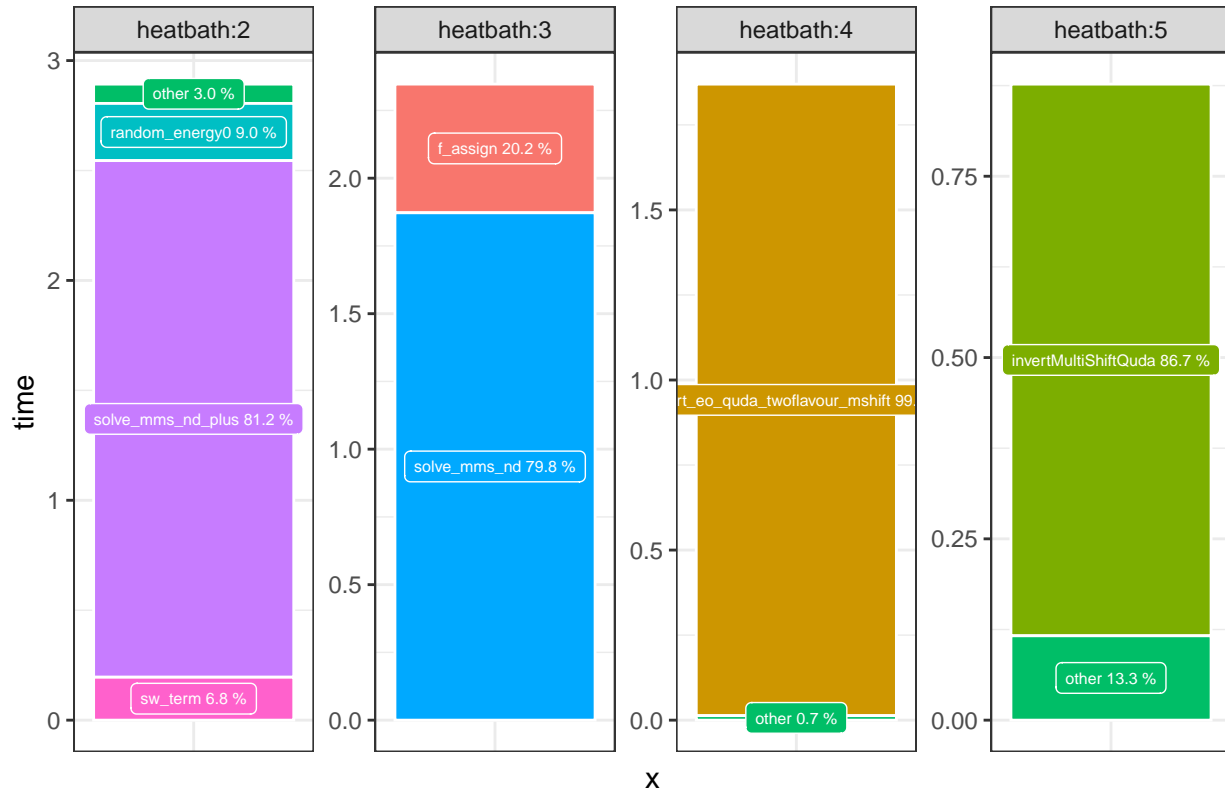


### ndcloverrat\_0\_3 derivative



level	name	time	prop
2	deriv_Sb	58.8	17.1
2	H_eo_sw_ndpsi	45.0	13.1
2	other	13.4	3.9
2	Qsw_tau1_sub_const_ndpsi	45.2	13.1
2	solve_mms_nd	76.4	22.2
2	sw_all	63.7	18.5
2	sw_spinor_eo	21.8	6.3
2	sw_term	19.6	5.7
3	invert_eo_quda_twoflavour_mshift	74.9	98.5
3	other	1.2	1.5
4	invertMultiShiftQuda	68.7	92.5
4	other	5.6	7.5

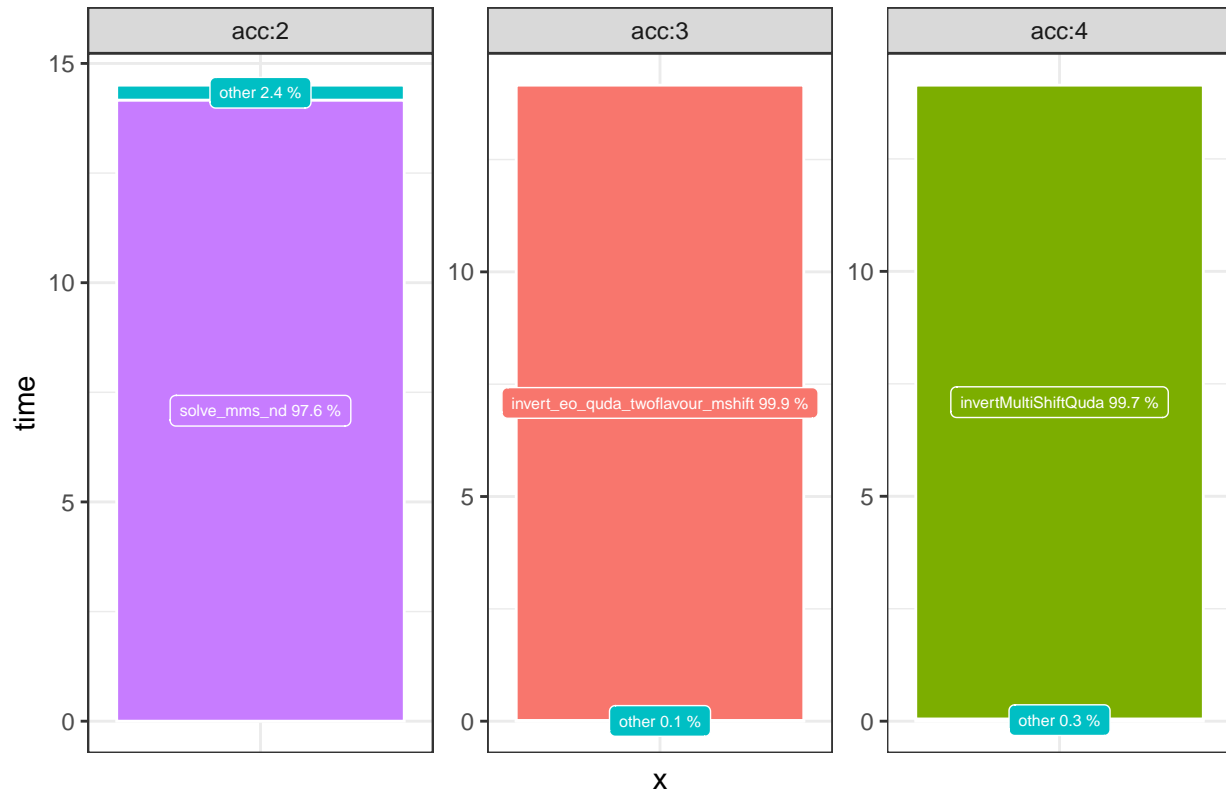
### ndcloverrat\_0\_3 heatbath



level	name	time	prop
2	other	0.1	3.0
2	random_energy0	0.3	9.0
2	solve_mms_nd_plus	2.3	81.2
2	sw_term	0.2	6.8
3	f_assign	0.5	20.2
3	solve_mms_nd	1.9	79.8
4	invert_eo_quda_twoflavour_mshift	1.9	99.3
4	other	0.0	0.7
5	invertMultiShiftQuda	0.8	86.7
5	other	0.1	13.3

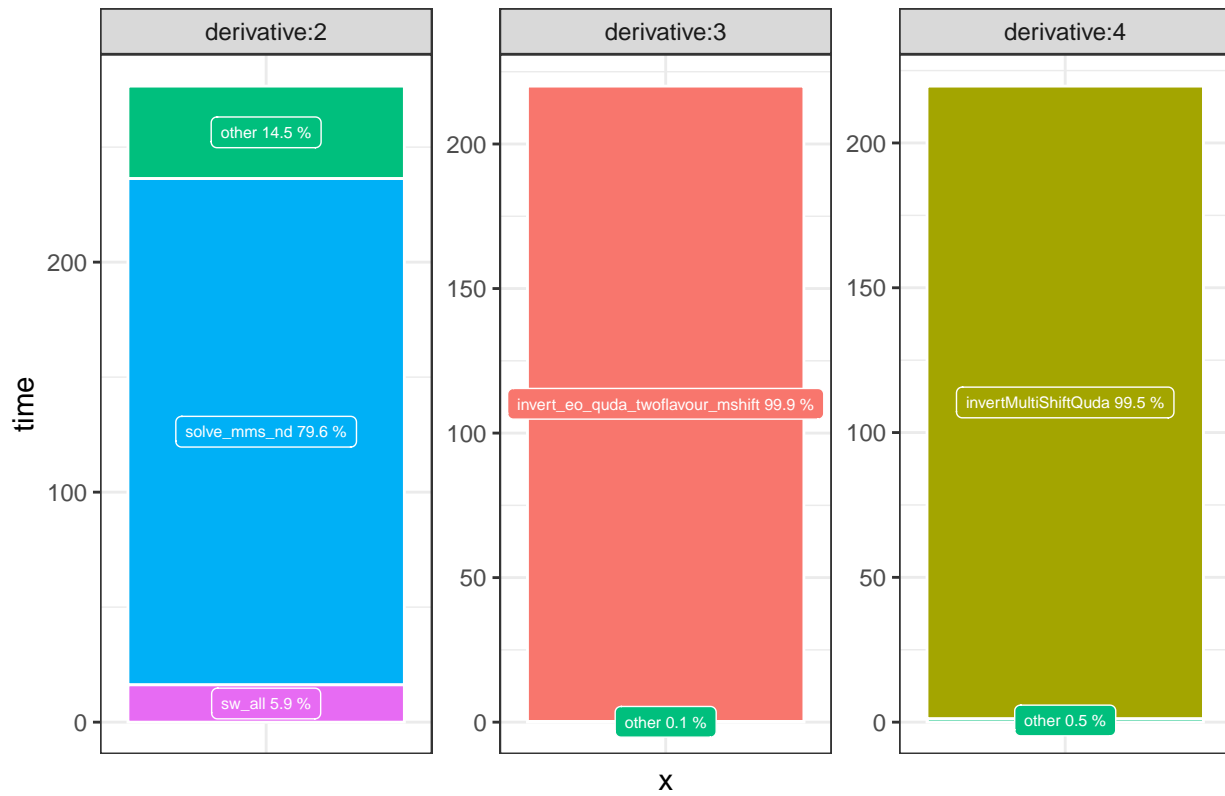
ndcloverrat\_7\_9

ndcloverrat\_7\_9 acc



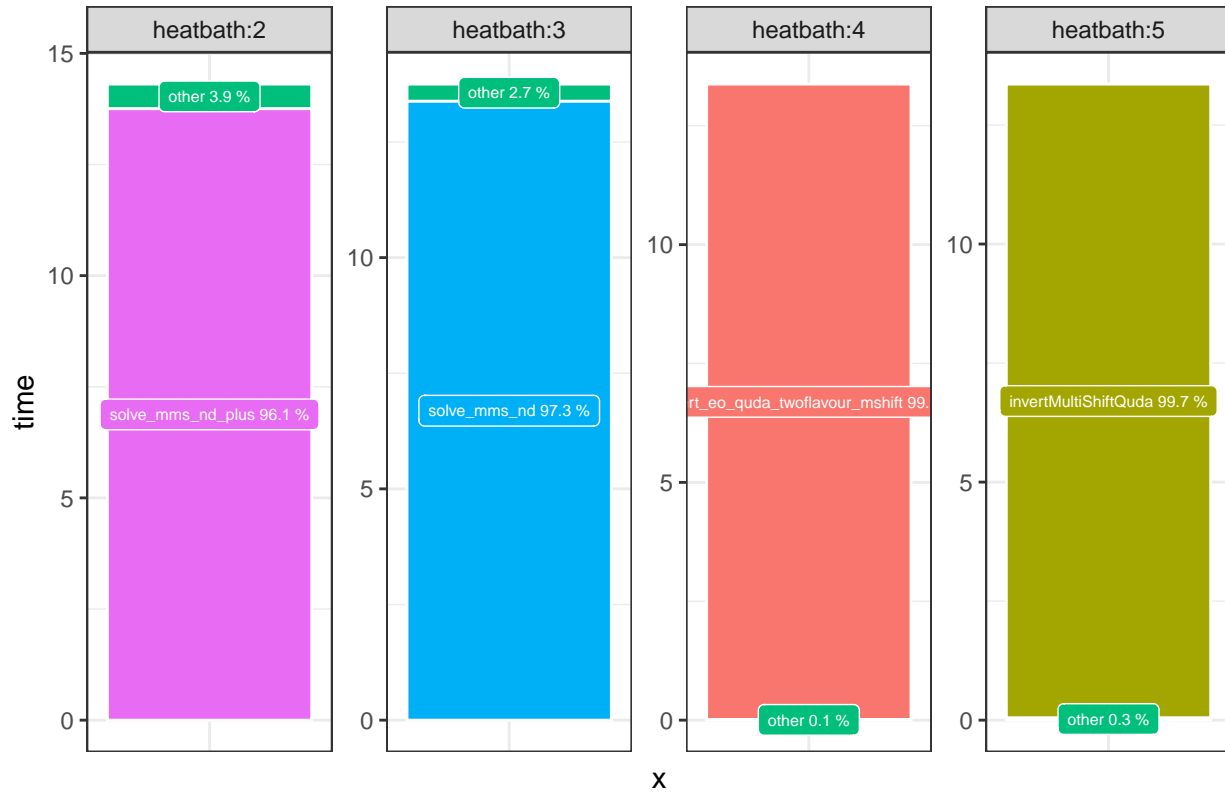
level	name	time	prop
2	other	0.3	2.4
2	solve_mms_nd	14.2	97.6
3	invert_eo_quda_twoflavour_mshift	14.1	99.9
3	other	0.0	0.1
4	invertMultiShiftQuda	14.1	99.7
4	other	0.0	0.3

# ndcloverrat\_7\_9 derivative



level	name	time	prop
2	other	40.2	14.5
2	solve_mms_nd	220.1	79.6
2	sw_all	16.2	5.9
3	invert_eo_quda_twoflavour_mshift	219.8	99.9
3	other	0.2	0.1
4	invertMultiShiftQuda	218.5	99.5
4	other	1.1	0.5

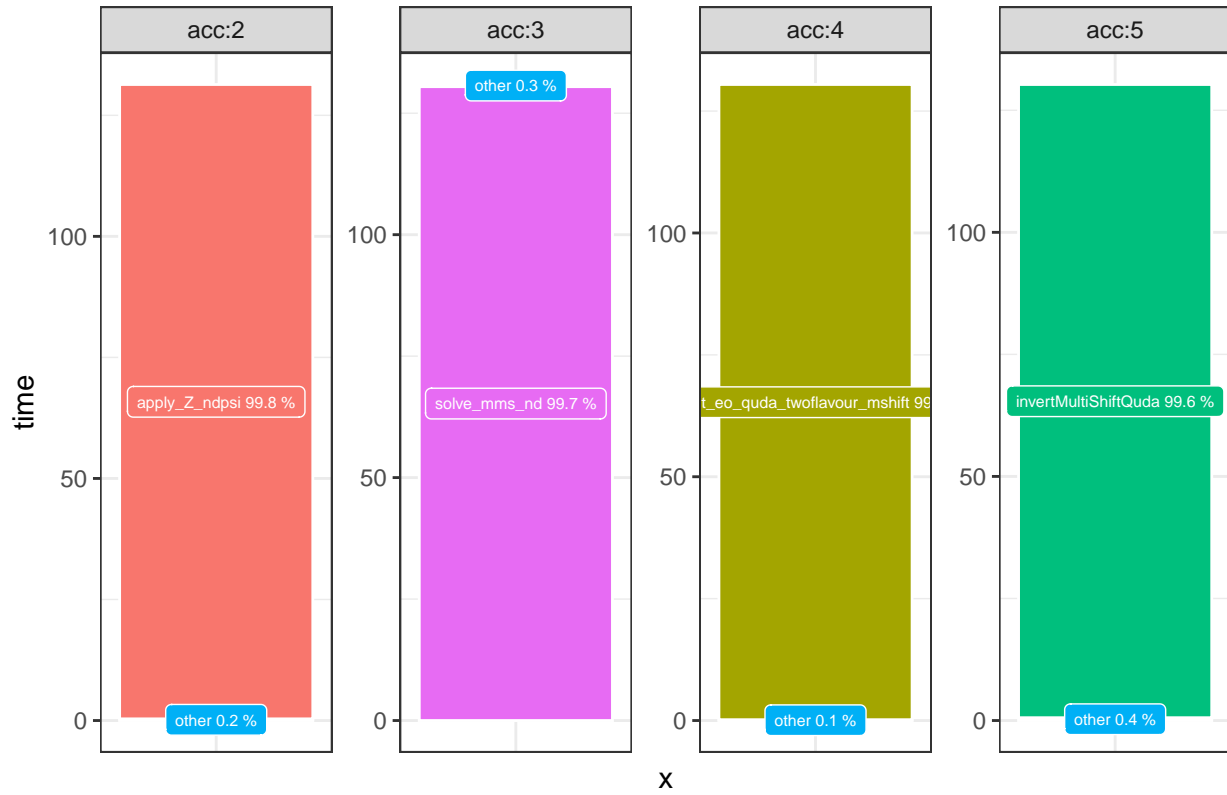
### ndcloverrat\_7\_9 heatbath



level	name	time	prop
2	other	0.6	3.9
2	solve_mms_nd_plus	13.8	96.1
3	other	0.4	2.7
3	solve_mms_nd	13.4	97.3
4	invert_eo_quda_twoflavour_mshift	13.4	99.9
4	other	0.0	0.1
5	invertMultiShiftQuda	13.3	99.7
5	other	0.0	0.3

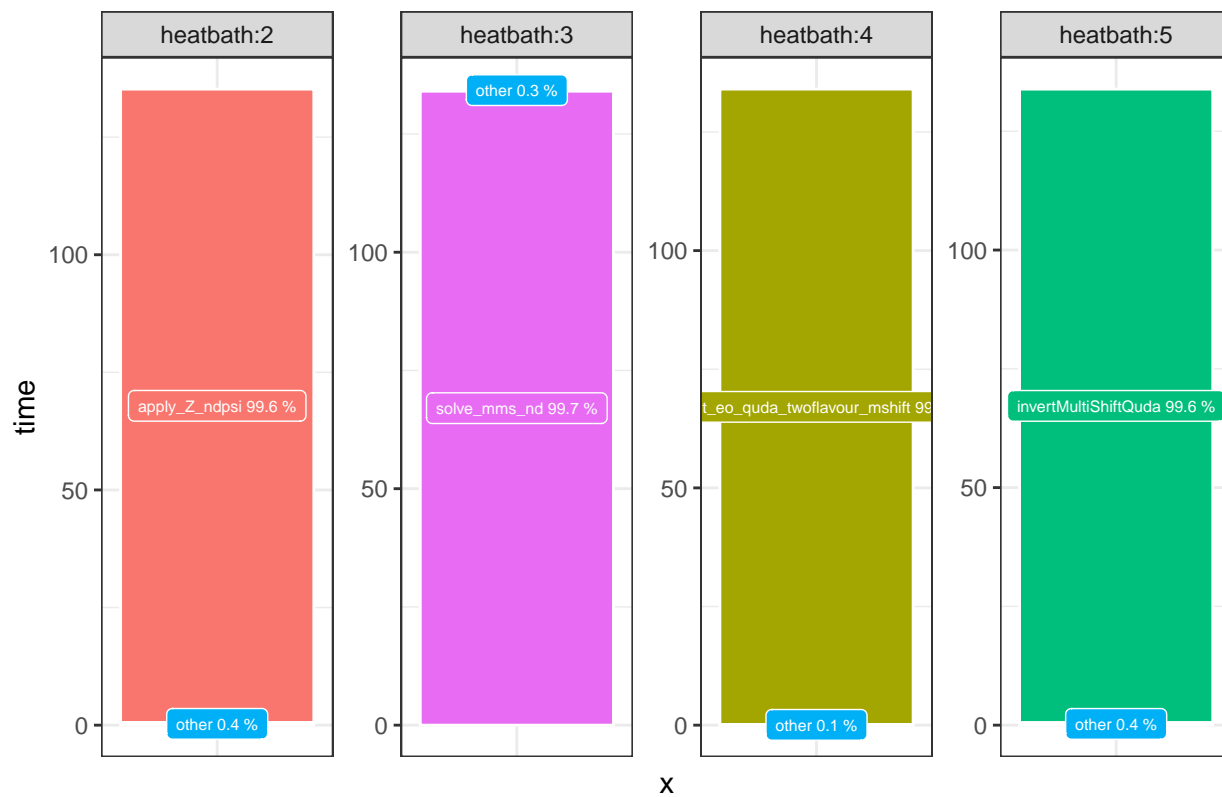
ndcloverratcor

ndcloverratcor acc



level	name	time	prop
2	apply_Z_ndpsi	131.1	99.8
2	other	0.3	0.2
3	other	0.4	0.3
3	solve_mms_nd	130.5	99.7
4	invert_eo_quda_twoflavour_mshift	130.3	99.9
4	other	0.1	0.1
5	invertMultiShiftQuda	129.8	99.6
5	other	0.5	0.4

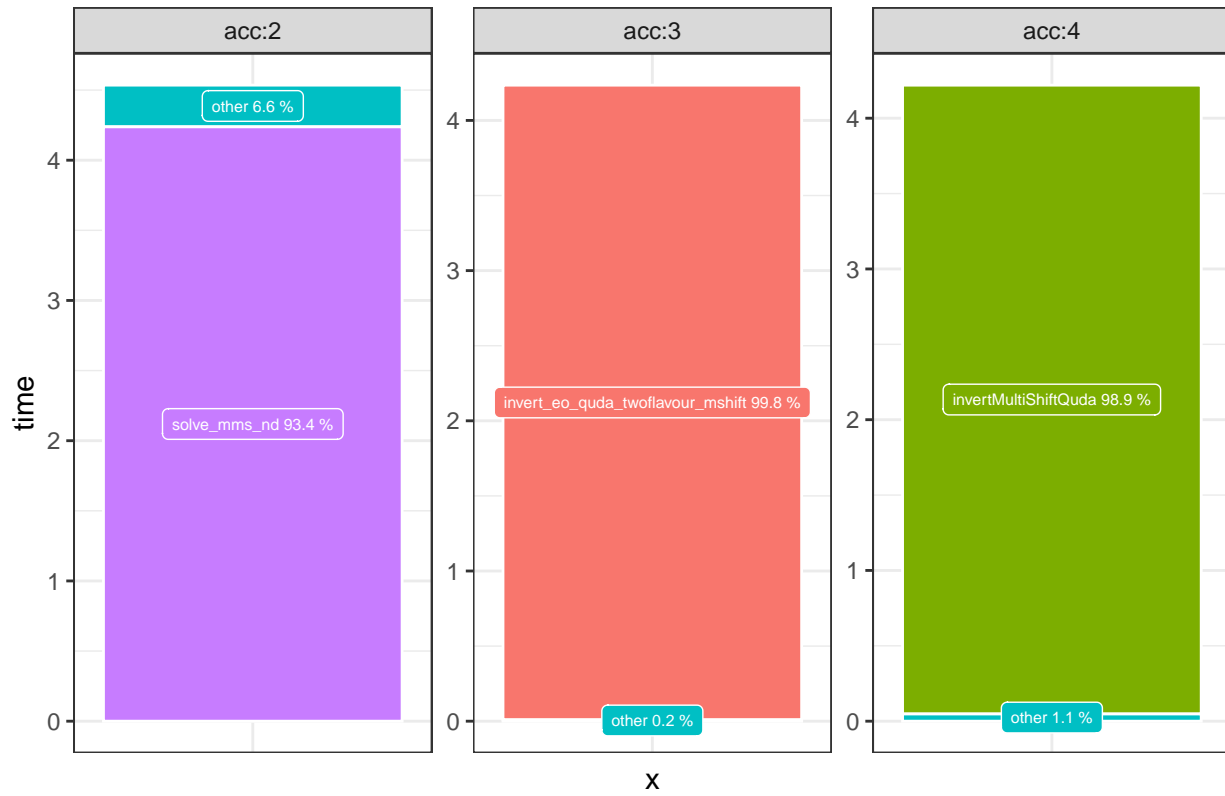
## ndcloverratcor heatbath



level	name	time	prop
2	apply_Z_ndpsi	134.7	99.6
2	other	0.6	0.4
3	other	0.4	0.3
3	solve_mms_nd	134.1	99.7
4	invert_eo_quda_twoflavour_mshift	133.9	99.9
4	other	0.1	0.1
5	invertMultiShiftQuda	133.3	99.6
5	other	0.5	0.4

ndcloverrat\_4\_6

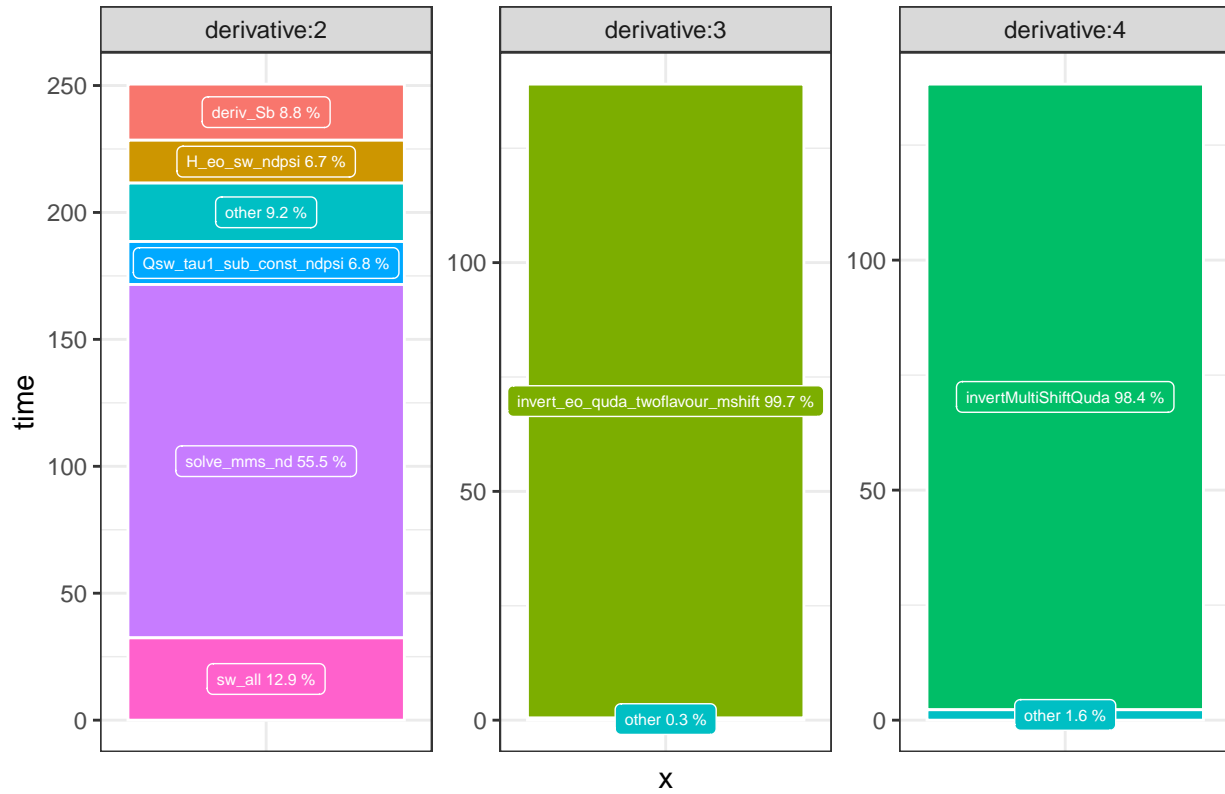
ndcloverrat\_4\_6 acc



level	name	time	prop
2	other	0.3	6.6
2	solve_mms_nd	4.2	93.4
3	invert_eo_quda_twoflavour_mshift	4.2	99.8
3	other	0.0	0.2
4	invertMultiShiftQuda	4.2	98.9
4	other	0.0	1.1

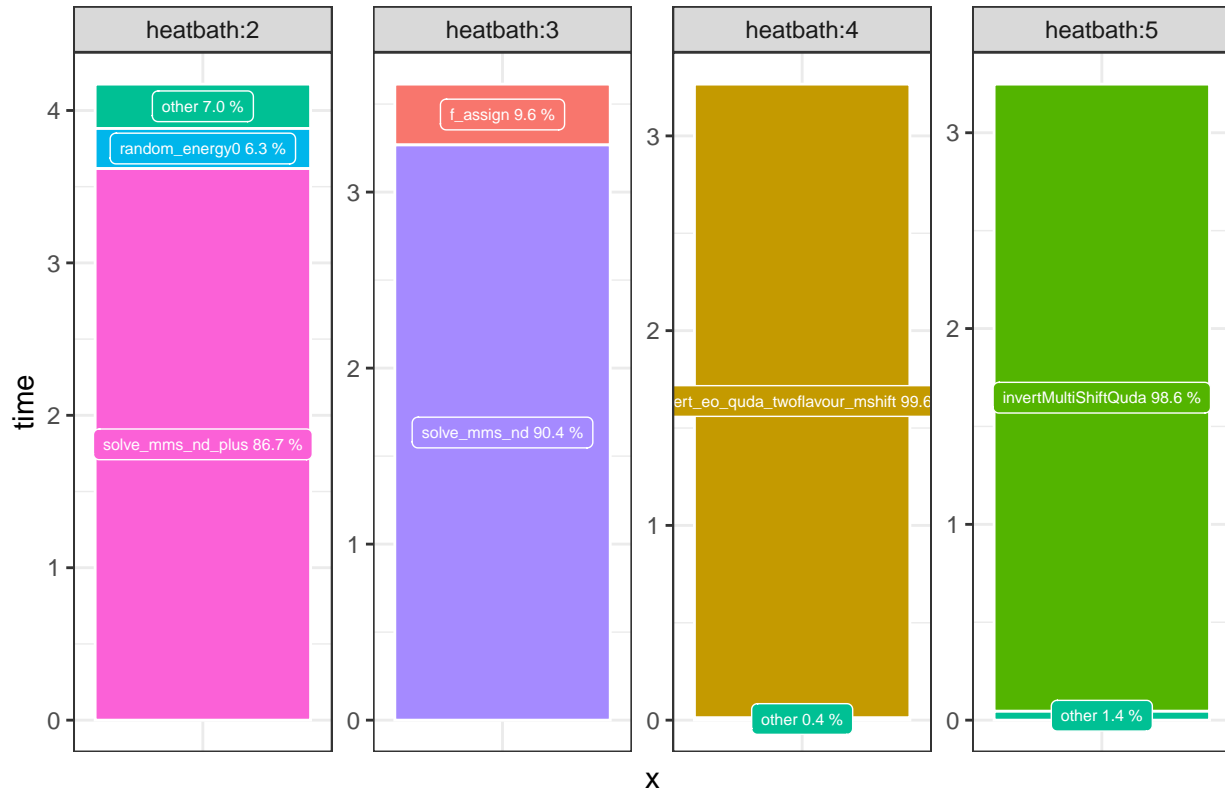


### ndcloverrat\_4\_6 derivative



level	name	time	prop
2	deriv_Sb	22.1	8.8
2	H_eo_sw_ndpsi	16.9	6.7
2	other	23.0	9.2
2	Qsw_tau1_sub_const_ndpsi	16.9	6.8
2	solve_mms_nd	139.2	55.5
2	sw_all	32.4	12.9
3	invert_eo_quda_twoflavour_mshift	138.6	99.7
3	other	0.5	0.3
4	invertMultiShiftQuda	136.0	98.4
4	other	2.3	1.6

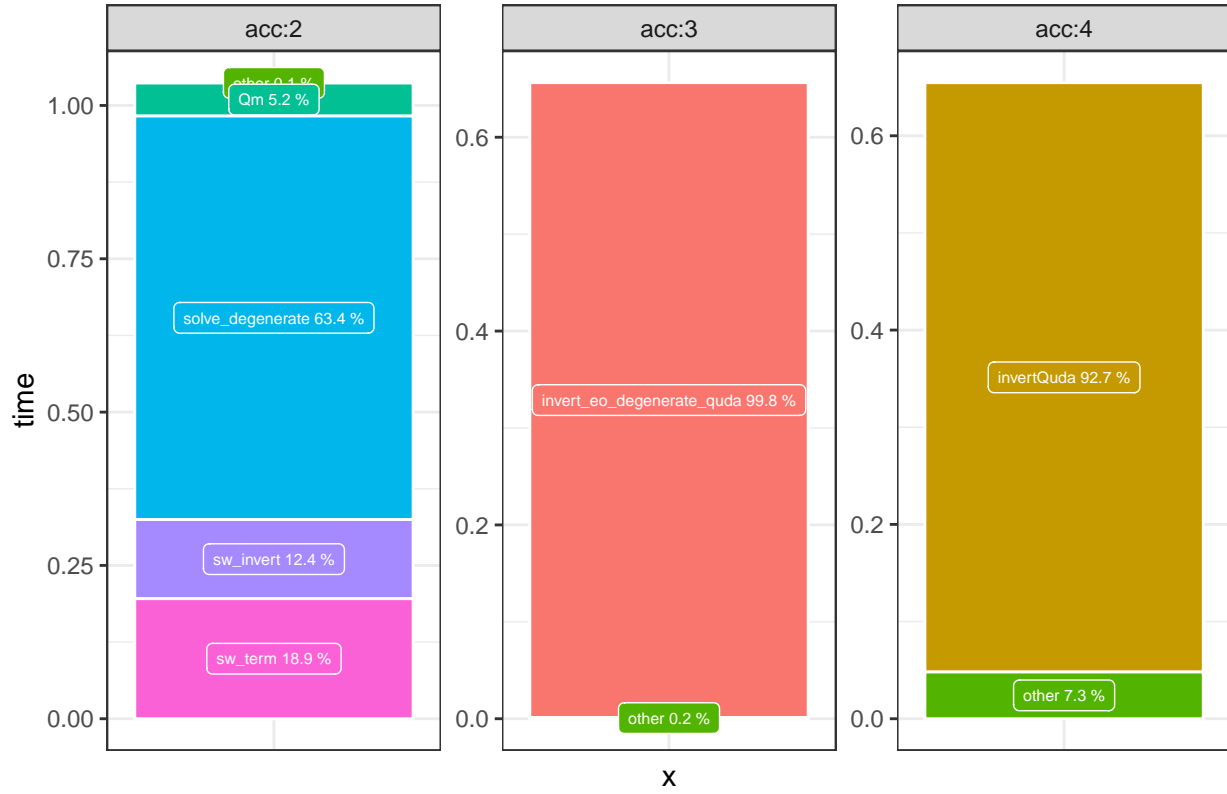
### ndcloverrat\_4\_6 heatbath



level	name	time	prop
2	other	0.3	7.0
2	random_energy0	0.3	6.3
2	solve_mms_nd_plus	3.6	86.7
3	f_assign	0.3	9.6
3	solve_mms_nd	3.3	90.4
4	invert_eo_quda_twoflavour_mshift	3.3	99.6
4	other	0.0	0.4
5	invertMultiShiftQuda	3.2	98.6
5	other	0.0	1.4

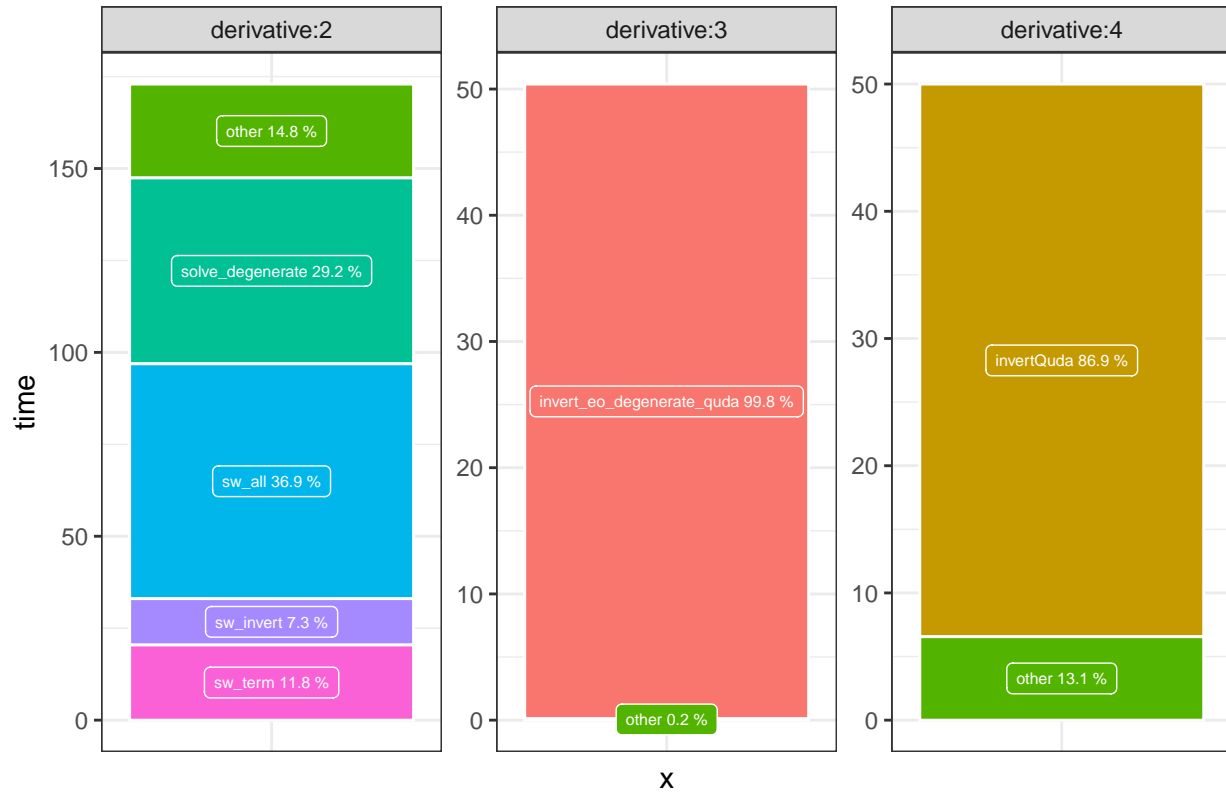
cloverdetlight

cloverdetlight acc



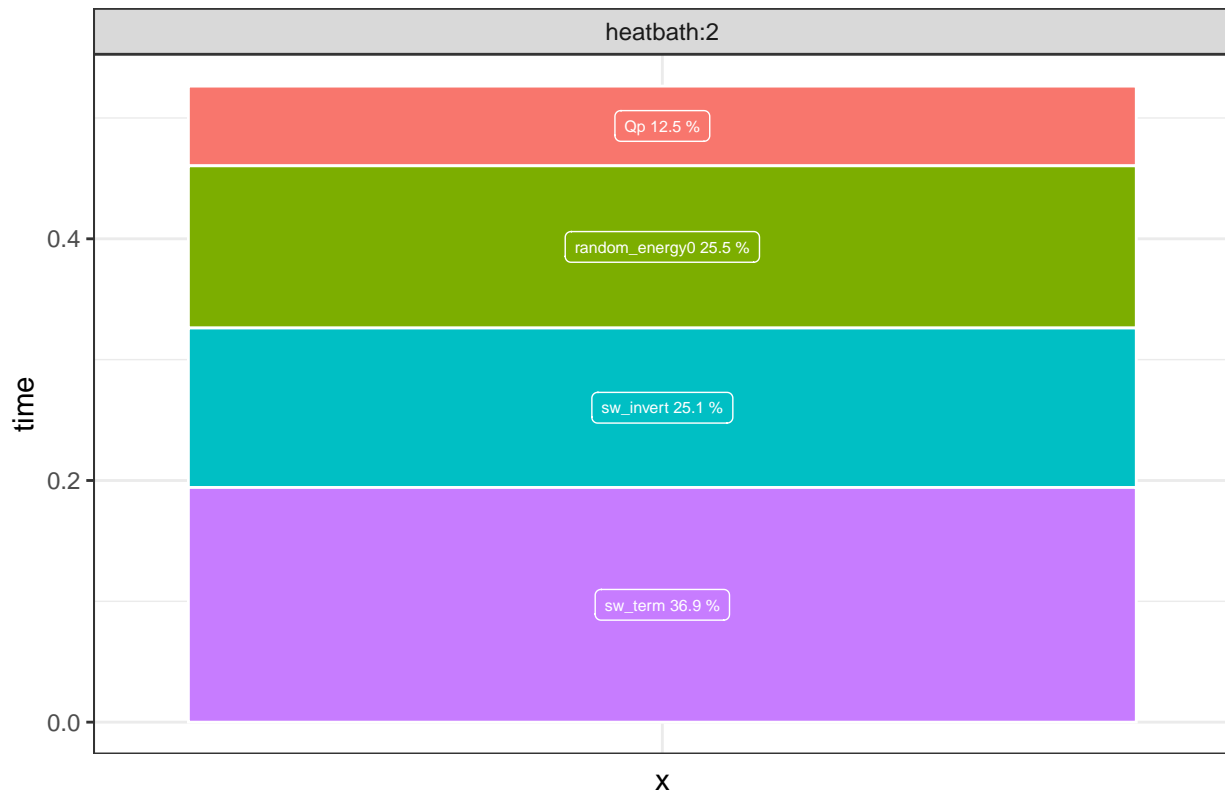
level	name	time	prop
2	other	0.0	0.1
2	Qm	0.1	5.2
2	solve_degenerate	0.7	63.4
2	sw_invert	0.1	12.4
2	sw_term	0.2	18.9
3	invert_eo_degenerate_quda	0.7	99.8
3	other	0.0	0.2
4	invertQuda	0.6	92.7
4	other	0.0	7.3

## cloverdetlight derivative



level	name	time	prop
2	other	25.5	14.8
2	solve_degenerate	50.5	29.2
2	sw_all	63.9	36.9
2	sw_invert	12.6	7.3
2	sw_term	20.4	11.8
3	invert_eo_degenerate_quda	50.3	99.8
3	other	0.1	0.2
4	invertQuda	43.4	86.9
4	other	6.6	13.1

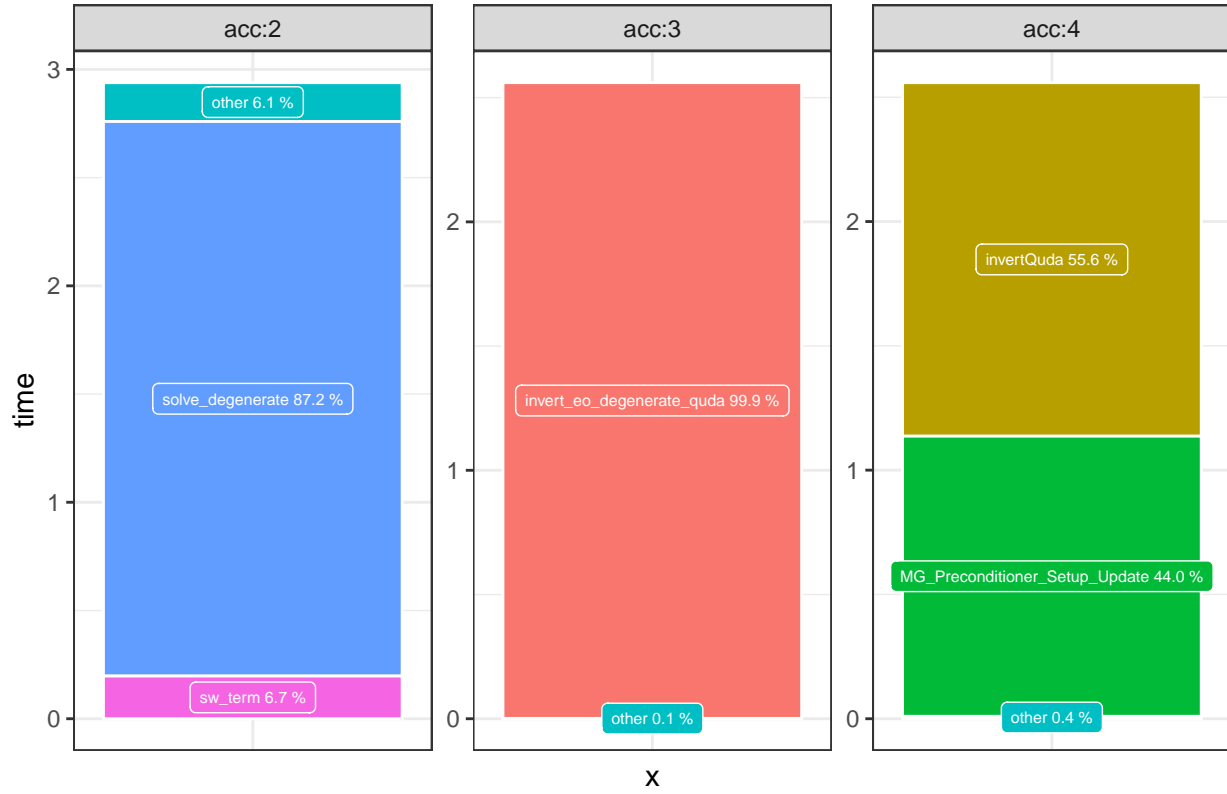
# cloverdetlight heatbath



level	name	time	prop
2	Qp	0.1	12.5
2	random_energy0	0.1	25.5
2	sw_invert	0.1	25.1
2	sw_term	0.2	36.9

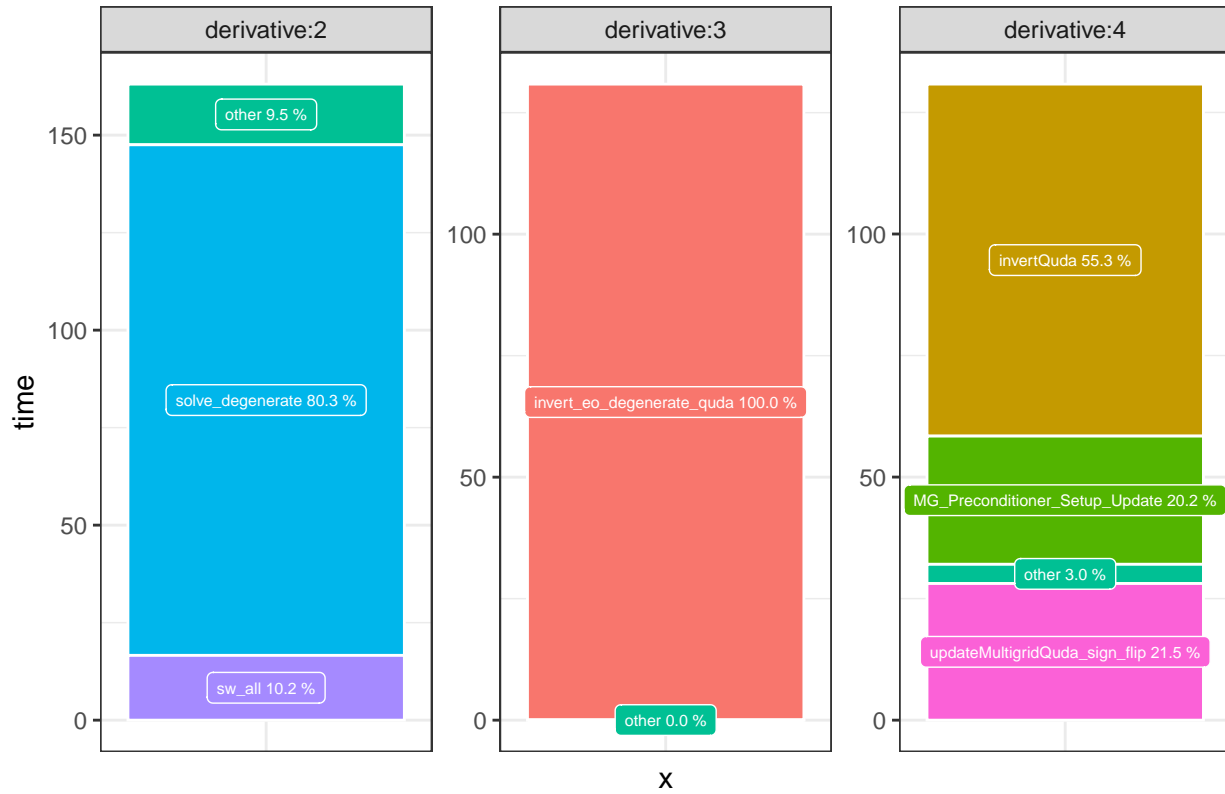
cloverdetratio2light

cloverdetratio2light acc



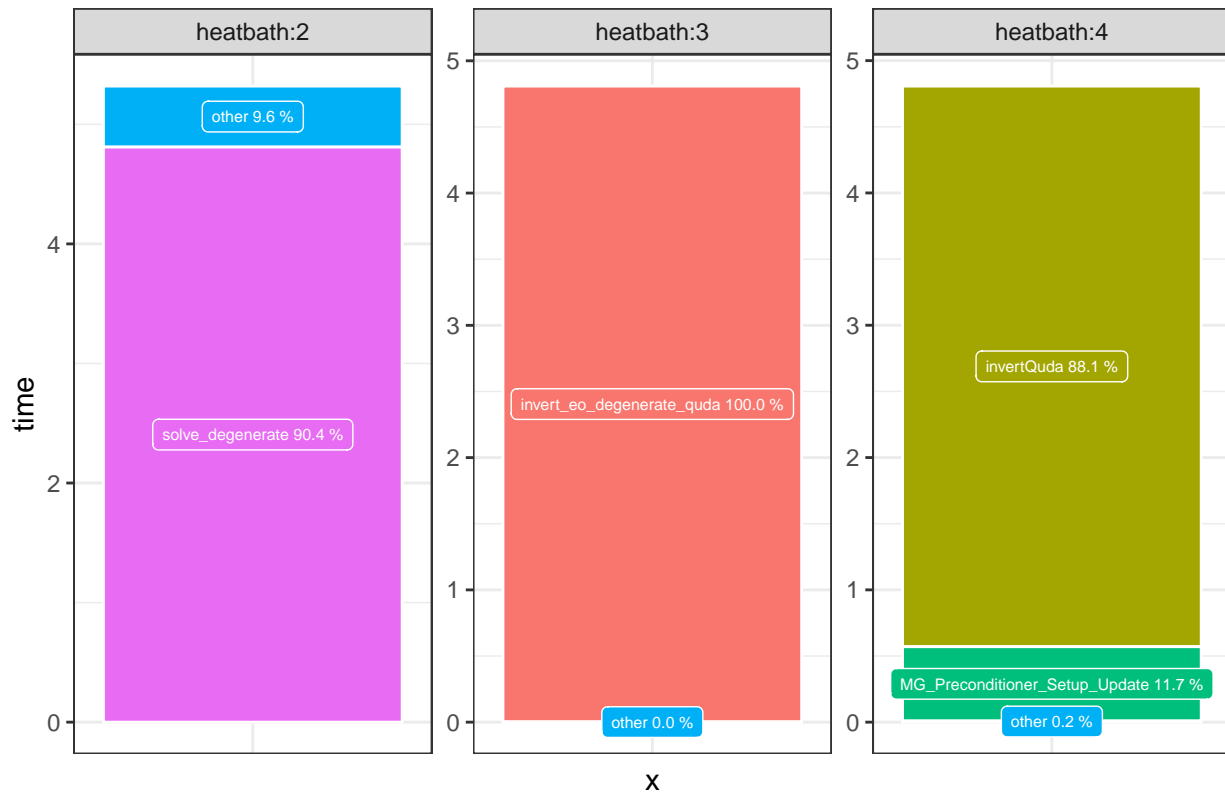
level	name	time	prop
2	other	0.2	6.1
2	solve_degenerate	2.6	87.2
2	sw_term	0.2	6.7
3	invert_eo_degenerate_quda	2.6	99.9
3	other	0.0	0.1
4	invertQuda	1.4	55.6
4	MG_Preconditioner_Setup_Update	1.1	44.0
4	other	0.0	0.4

## cloverdetratio2light derivative



level	name	time	prop
2	other	15.6	9.5
2	solve_degenerate	130.9	80.3
2	sw_all	16.6	10.2
3	invert_eo_degenerate_quda	130.8	100.0
3	other	0.0	0.0
4	invertQuda	72.4	55.3
4	MG_Preconditioner_Setup_Update	26.4	20.2
4	other	3.9	3.0
4	updateMultigridQuda_sign_flip	28.1	21.5

# cloverdetratio2light heatbath

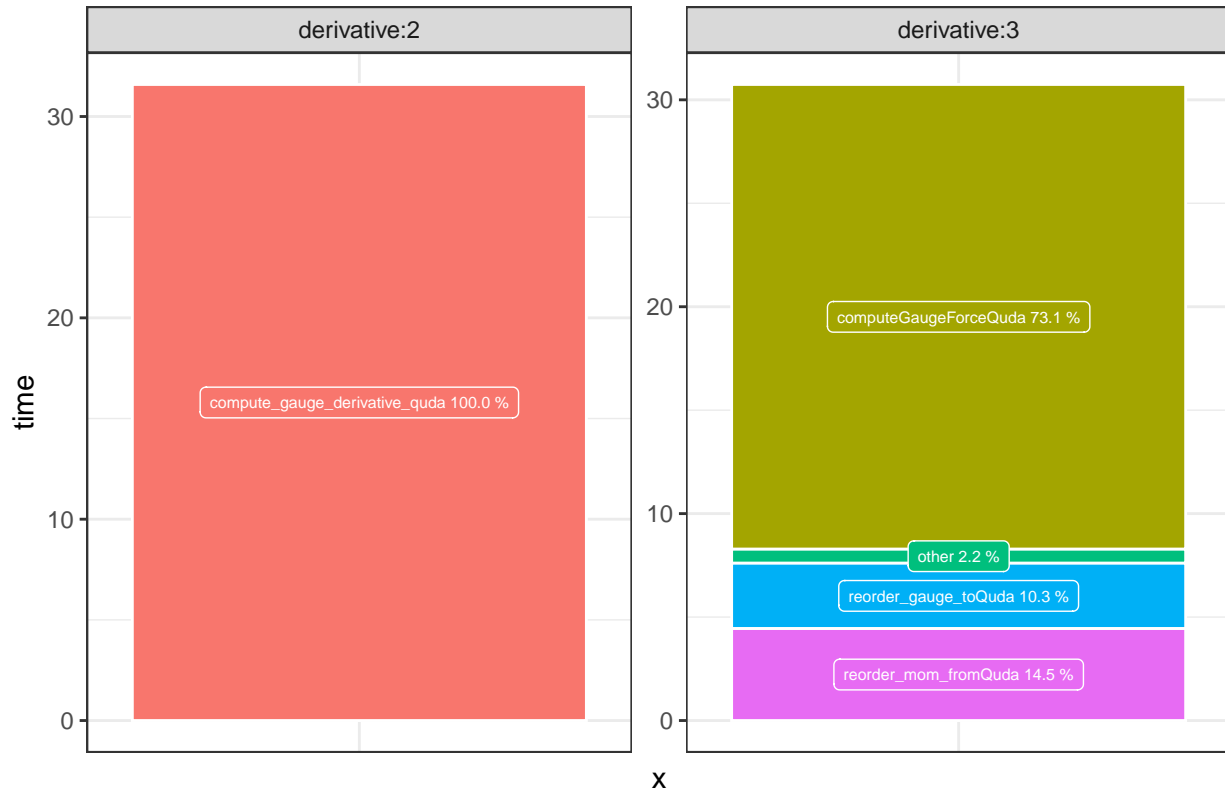


level	name	time	prop
2	other	0.5	9.6
2	solve_degenerate	4.8	90.4
3	invert_eo_degenerate_quda	4.8	100.0
3	other	0.0	0.0
4	invertQuda	4.2	88.1
4	MG_Preconditioner_Setup_Update	0.6	11.7
4	other	0.0	0.2



# GAUGE

## GAUGE derivative



level	name	time	prop
2	compute_gauge_derivative_quda	31.6	100.0
3	computeGaugeForceQuda	22.5	73.1
3	other	0.7	2.2
3	reorder_gauge_toQuda	3.2	10.3
3	reorder_mom_fromQuda	4.4	14.5