KRIPKE 3 parameter

		model	total cost	percent cost	RSS	Adj. R^2	RE	Comments
Ltimes	***baseline****	12.68+3.67*10^-2*d^(5/4)*g				0.989		*Baseline result from Fast Multi Parameter Performance Modeling paper.*
	normal	+ -23.215 + 6.93207*(d^1) + 0.0135415*(g^1.25)*log2^1(g) + -5.35724e-08*(p^1.5)	43872980.46	100.00	5750.00	0.938	0.196	*Result of the old multi parameter modeler.*
	Sparse cheap 125	+ -23.215 + $-5.357 \times 10^{-08} * (p^{1.5})$ + 6.932*(d) + 0.014*$(g^{1.25})*\log_2(g)$	43872980.46	100.00	5747.33	0.938	0.196	*Sparse modeler shows the same result as the old modeler with the same points.*
	Sparse exp 125	+ -14.363 + -0.0491419*log2^1(p) + 1.63868*(d^0.5)*log2^2(d) + 0.02491*(g^0.75)*log2^2(g)	43872980.46	100.00	5480.00	0.941	0.190	*Using different base points leads to different models. Maybe we model the behavior of the runtime at larger scales, as the parameters of the expensive points are much bigger.*
	sparse cheap base	+ -2.751 + $-1.579 \times 10^{-08} * (p^{1.5})$ + 3.553*(d) + $7.930 \times 10^{-03} * (g^{1.25})*\log_2(g)$	274923.23	0.63	2.84	0.998	0.020	*Same result as with cheap base points and all additional points. Only slightly different coefficients. Looks like for KRIPKE we do not need any additional points for a good model.*
	sparse exp base	+ -63.432 + 0.059*$\log_2(p)$ + 2.456*$(d^{0.5})*\log_2^2(d)$ + 0.039*$(g^{0.75})*\log_2^2(g)$	21011077.34	47.89	0.57	1.000	2.875*10^-3	*Same result as with exp base points and all additional points. This result also indocates that we do not need any additional points. But we are modeling a different behavior.*
	sparse cheap +1	+ -2.602 + $-4.534 \times 10^{-08} * (p^{1.5})$ + 3.562*(d) + $7.934 \times 10^{-03} * (g^{1.25})*\log_2(g)$	275103.00	0.63	8.14	0.993	0.024	*An additional point does not seem to increase the accuracy of the model. Therefore, we can save it to further reduce the cost of modeling.*
	sparse exp +1	+ -10.485 + -1.486*$\log_2(p)$ + 1.925*$(d^{0.5})*\log_2^2(d)$ + 0.030*$(g^{0.75})*\log_2^2(g)$	21011137.47	47.89	528.38	0.961	0.163	*An additional point does not seem to increase the accuracy of the model. Therefore, we can save it to further reduce the cost of modeling.*

* Basline from Fast Multi Parameter Performance Modeling paper

We use only 125 points for modeling to save the rest for further scaling evaluation etc.

The costs are the same for each kernel off cause, as they are based on the same measurements.

Parameters are the number of processes p, the number of direction-sets d and the number of energy groups g.

Parameter values are p=[8,64,512,4096,32768], d=[2,4,6,8,10], g=[32,64,96,128,160].

For each measurement we took 5 repetitions.

KRIPKE 3 parameter

		model	total cost	percent cost	RSS	Adj. R^2	RE	Comments
LplusTimes	***baseline****	9.82 + 9.62 · 10 −3 · d · g 3/2				0.991		*Baseline result from Fast Multi Parameter Performance Modeling paper.*
	normal	$+ -23.215 + 6.932*(d) + 0.014*(g^{1.25})*\log_2(g) + -5.357x10^{-08}*(p^{1.5})$	43872980.46	100.00		0.938	0.196	*Result of the old multi parameter modeler.*
	Sparse cheap 125	$+ -39.266 + 14.773*\log_2{}^{-1}(p) + 6.033*(d^{0.666667})*\log_2(d) + 6.851x10^{-03}*(g^{1.5})*\log_2(g)$	43872980.46	100.00		0.876	0.461	*Sparse modeler shows the same result as the old modeler with the same points.*
	Sparse exp 125	$+ 27.422 + 2.054x10^{-04}*\log_2(p)*(d)*(g^{1.33333})*\log_2(g)$	43872980.46	100.00		0.597	0.562	*Using different base points leads to different models. Maybe we model the behavior of the runtime at larger scales, as the parameters of the expensive points are much bigger.*
	sparse cheap base	$+ 1.975 + -0.410*\log_2{}^{-1}(p) + 2.013*(d^{0.666667})*\log_2(d) + 2.341x10^{-03}*(g^{1.5})*\log_2(g)$	274923.23	0.63		0.992	0.028	*Same result as with cheap base points and all additional points. Only slightly different coefficients. Looks like for KRIPKE we do not need any additional points for a good model.*
	sparse exp base	$+ -147.544 + -1.055*\log_2(p) + 18.319*(d) + 0.026*(g^{1.33333})*\log_2(g)$	21011077.34	47.89		0.996	0.023	*Same result as with exp base points and all additional points. This result also indocates that we do not need any additional points. But we are modeling a different behavior.*
	sparse cheap +1	$+ 1.812 + 1.764*\log_2{}^{-1}(p) + 1.994*(d^{0.666667})*\log_2(d) + 2.313x10^{-03}*(g^{1.5})*\log_2(g)$	275103.00	0.63		0.984	0.036	*An additional point does not seem to increase the accuracy of the model. Therefore, we can save it to further reduce the cost of modeling.*
	sparse exp +1	$+ -36.682 + -4.157*\log_2(p) + 13.667*(d) + 0.020*(g^{1.33333})*\log_2(g)$	21011137.47	47.89		0.951	0.304	*An additional point does not seem to increase the accuracy of the model. Therefore, we can save it to further reduce the cost of modeling.*

* Basline from Fast Multi Parameter Performance Modeling paper

We use only 125 points for modeling to save the rest for further scaling evaluation etc.

The costs are the same for each kernel off cause, as they are based on the same measurements.

Parameters are the number of processes p, the number of direction-sets d and the number of energy groups g.

Parameter values are p=[8,64,512,4096,32768], d=[2,4,6,8,10], g=[32,64,96,128,160].

For each measurement we took 5 repetitions.

KRIPKE 3 parameter

		model	total cost	percent cost	RSS	Adj. R^2	RE	Comments
Sweep	***baseline****	4.91 + 4.83 · 10 −3 · p 1/3 · d · g + 0.90 · d · g				0.994		*Baseline result from Fast Multi Parameter Performance Modeling paper.*
	normal	+ 5.417 + 0.022*$(d^{0.75})$*$(g^{0.8})$*$(p^{0.333333})$	43872980.46	100.00		0.977	0.204	*Result of the old multi parameter modeler.*
	Sparse cheap 125	+ 5.417 + 0.022*$(p^{0.333333})$*$(d^{0.75})$*$(g^{0.8})$	43872980.46	100.00		0.977	0.204	*Sparse modeler shows the same result as the old modeler with the same points.*
	Sparse exp 125	+ 12.256 + 2.957x10^{-04}*$(p^{0.333333})$*$(d^{1.25})$*$(g^{0.666667})$*$\log_2(g)$	43872980.46	100.00		0.981	0.303	*Using different base points leads to different models. Maybe we model the behavior of the runtime at larger scales, as the parameters of the expensive points are much bigger.*
	sparse cheap base	+ -4.112 + 0.633*$(p^{0.333333})$ + 1.771*$(d^{0.75})$ + 0.143*$(g^{0.8})$	274923.23	0.63		1.000	0.011	*Same result as with cheap base points and all additional points. Only slightly different coefficients. Looks like for KRIPKE we do not need any additional points for a good model.*
	sparse exp base	+ -420.213 + 7.321*$(p^{0.333333})$ + 12.014*$(d^{1.25})$ + 0.146*$(g^{0.666667})$*$\log_2(g)$	21011077.34	47.89		1.000	6.418*10^-3	*Same result as with exp base points and all additional points. This result also indocates that we do not need any additional points. But we are modeling a different behavior.*
	sparse cheap +1	+ -4.082 + 0.629*$(p^{0.333333})$ + 1.790*$(d^{0.75})$ + 0.145*$(g^{0.8})$	275103.00	0.63		0.991	0.030	*An additional point does not seem to increase the accuracy of the model. Therefore, we can save it to further reduce the cost of modeling.*
	sparse exp +1	+ 24.349 + 2.658x10^{-04}*$(p^{0.333333})$*$(d^{1.25})$*$(g^{0.666667})$*$\log_2(g)$	21011137.47	47.89		0.981	0.721	*An additional point does not seem to increase the accuracy of the model. Therefore, we can save it to further reduce the cost of modeling.*

* Basline from Fast Multi Parameter Performance Modeling paper

We use only 125 points for modeling to save the rest for further scaling evaluation etc.

The costs are the same for each kernel off cause, as they are based on the same measurements.

Parameters are the number of processes p, the number of direction-sets d and the number of energy groups g.

Parameter values are p=[8,64,512,4096,32768], d=[2,4,6,8,10], g=[32,64,96,128,160].

For each measurement we took 5 repetitions.

KRIPKE 3 parameter

		model	total cost	percent cost	RSS	Adj. R^2	RE	Comments
MPI_WaitAll	***baseline****							
	normal	$+ 0.133 + 3.362x10^{-05}*(d^3)*\log_2(d) + 3.313x10^{-05}*(g^{1.66667}) + -0.430*\log_2^{-1}(p)$	43872980.46	100.00		0.806	0.195	*Result of the old multi parameter modeler.*
	Sparse cheap 125	$+ 0.133 + -0.430*\log_2^{-1}(p) + 3.362x10^{-05}*(d^3)*\log_2(d) + 3.313x10^{-05}*(g^{1.66667})$	43872980.46	100.00		0.806	0.195	*Sparse modeler shows the same result as the old modeler with the same points.*
	Sparse exp 125	$+ 0.047 + -2.575*(p^{-1})*\log_2^{-1}(p) + 2.484x10^{-03}*(d^{0.666667})*\log_2^2(d) + 7.118x10^{-05}*(g^{0.75})*\log_2^2(g)$	43872980.46	100.00		0.850	0.177	*Using different base points leads to different models. Maybe we model the behavior of the runtime at larger scales, as the parameters of the expensive points are much bigger.*
	sparse cheap base	$+ 0.107 + -0.141*\log_2^{-1}(p) + 3.818x10^{-06}*(d^3)*\log_2(d) + 8.736x10^{-06}*(g^{1.66667})$	274923.23	0.63		0.955	0.027	*Same result as with cheap base points and all additional points. Only slightly different coefficients. Looks like for KRIPKE we do not need any additional points for a good model.*
	sparse exp base	$+ -0.139 + -6.631*(p^{-1})*\log_2^{-1}(p) + 4.736x10^{-03}*(d^{0.666667})*\log_2^2(d) + 1.298x10^{-04}*(g^{0.75})*\log_2^2(g)$	21011077.34	47.89		0.979	0.020	*Same result as with exp base points and all additional points. This result also indocates that we do not need any additional points. But we are modeling a different behavior.*
	sparse cheap +1	$+ 0.107 + -0.142*\log_2^{-1}(p) + 3.914x10^{-06}*(d^3)*\log_2(d) + 8.788x10^{-06}*(g^{1.66667})$	275103.00	0.63		0.958	0.026	*An additional point does not seem to increase the accuracy of the model. Therefore, we can save it to further reduce the cost of modeling.*
	sparse exp +1	$+ 0.062 + -3.005*(p^{-1})*\log_2^{-1}(p) + 2.491x10^{-03}*(d^{0.666667})*\log_2^2(d) + 7.288x10^{-05}*(g^{0.75})*\log_2^2(g)$	21011137.47	47.89		0.693	0.290	*An additional point does not seem to increase the accuracy of the model. Therefore, we can save it to further reduce the cost of modeling.*

* Basline from Fast Multi Parameter Performance Modeling paper

We use only 125 points for modeling to save the rest for further scaling evaluation etc.

The costs are the same for each kernel off cause, as they are based on the same measurements.

Parameters are the number of processes p, the number of direction-sets d and the number of energy groups g.

Parameter values are p=[8,64,512,4096,32768], d=[2,4,6,8,10], g=[32,64,96,128,160].

For each measurement we took 5 repetitions.