CVC4 IEEE-754 implementation

Current status and benchmarks

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1.

CVC4 Progress

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FP progress in CVC4

Solved

Benchmark	07-04	07-27
Schanda	27.5%	67.4%
Griggio	16.4%	17.3%
Heizmann	4.8%	69.1%
Industrial_1	0.0%	71.3%
Industrial_1_qf	0.0%	96.3%
NyxBrain	99.8%	99.8%
PyMPF	73.9%	97.4%
SPARK 2014	0.0%	79.0%
SPARK QF	0.0%	86.2%
Wintersteiger	85.0%	99.9%

FP progress in CVC4

Error

Benchmark	07-04	07-27
Schanda	86	2
Griggio	✓	✓
Heizmann	195	2
Industrial_1	268	3
Industrial_1_qf	268	✓
NyxBrain	40	4
PyMPF	13920	45
SPARK 2014	2468	15
SPARK QF	2468	52
Wintersteiger	5668	✓

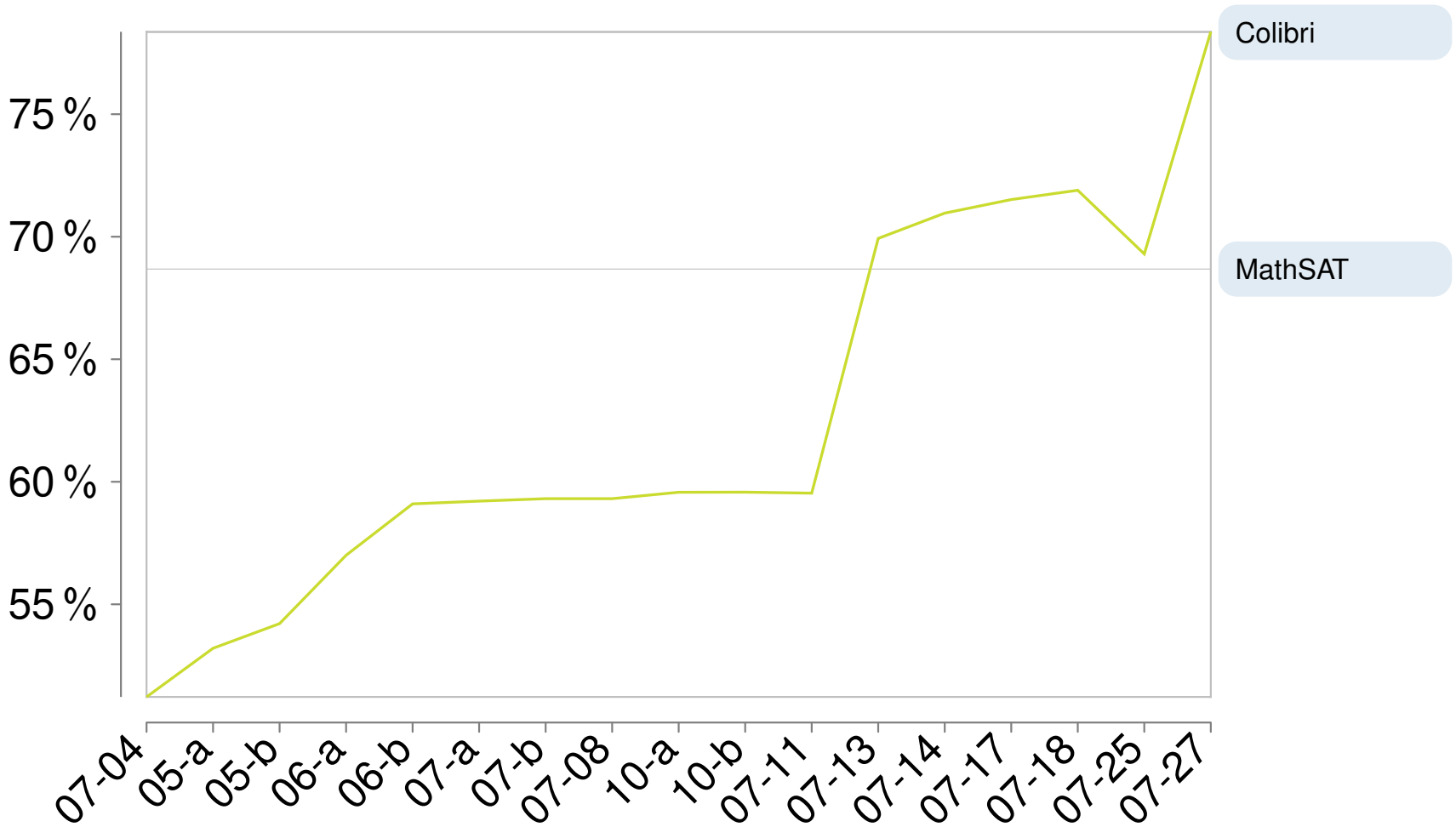
FP progress in CVC4

Unsound

Benchmark	07-04	07-27
Schanda	8	1
Heizmann	✓	✓
NyxBrain	✓	✓
PyMPF	818	1427
SPARK 2014	✓	✓
Wintersteiger	351	28

FP progress in CVC4

Solved over time (average of averages)



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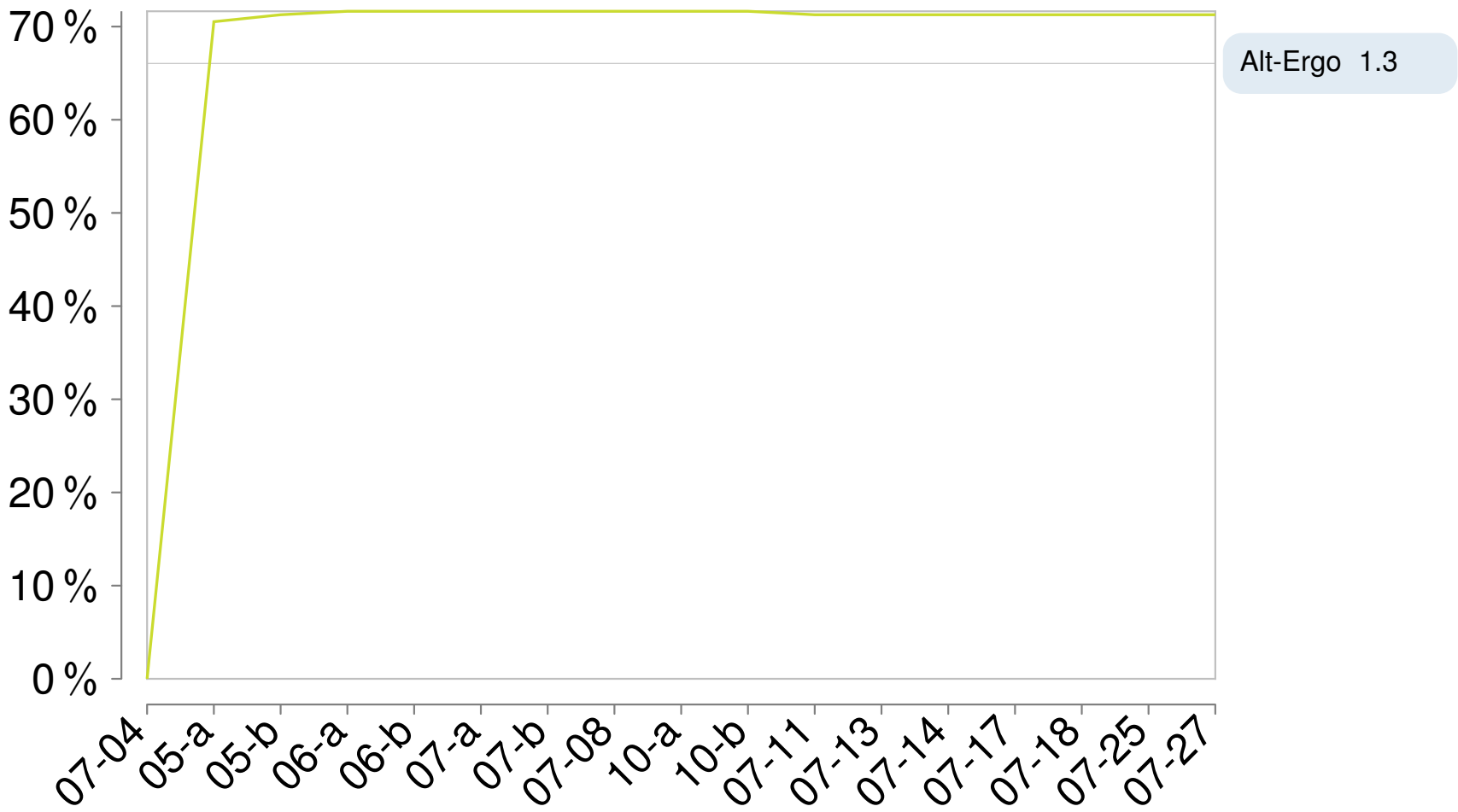
FP progress in CVC4

VCs solved on Industrial_1



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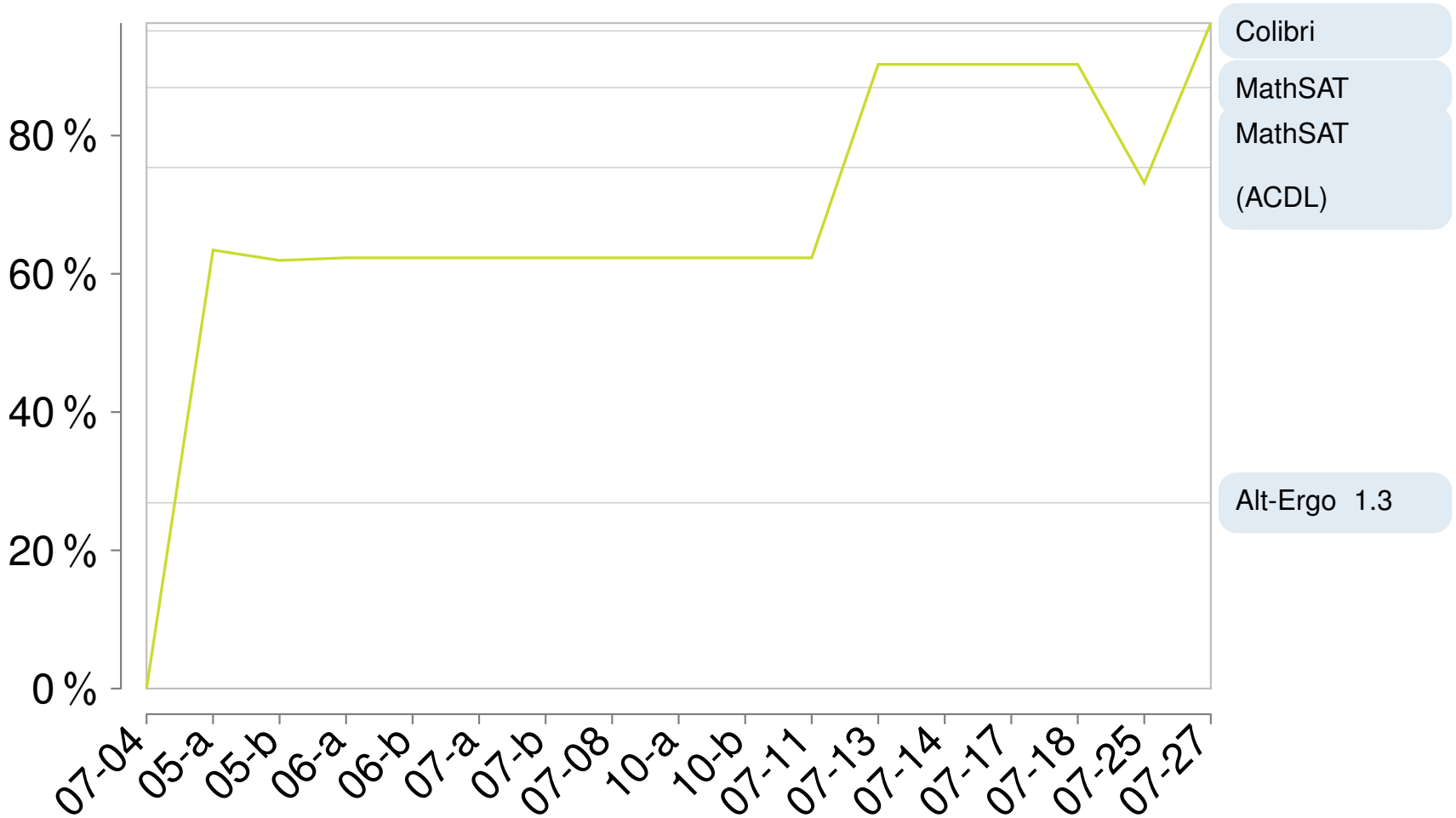
FP progress in CVC4

VCs solved on Industrial_1_qf



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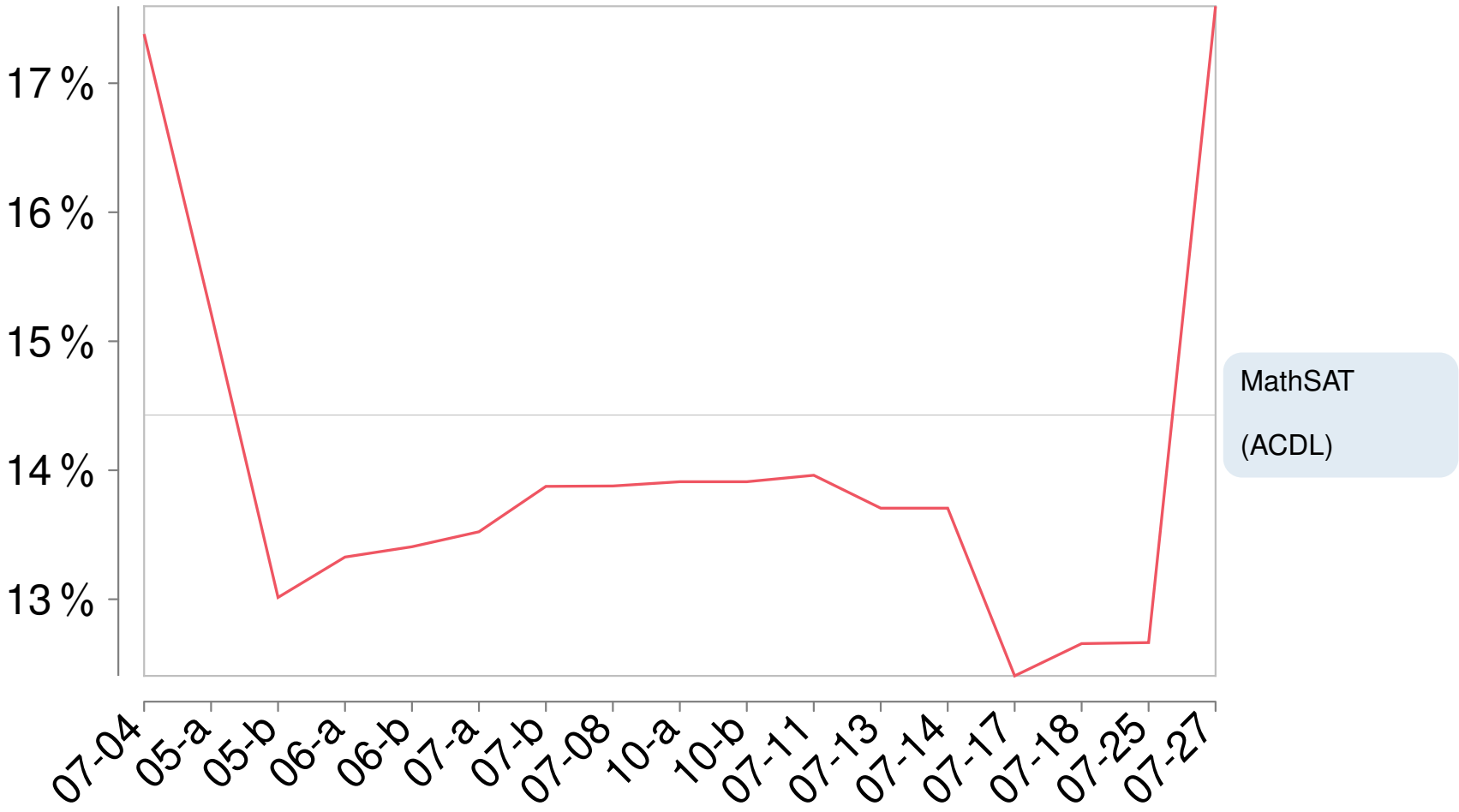
FP progress in CVC4

Timeout over time (average of averages)



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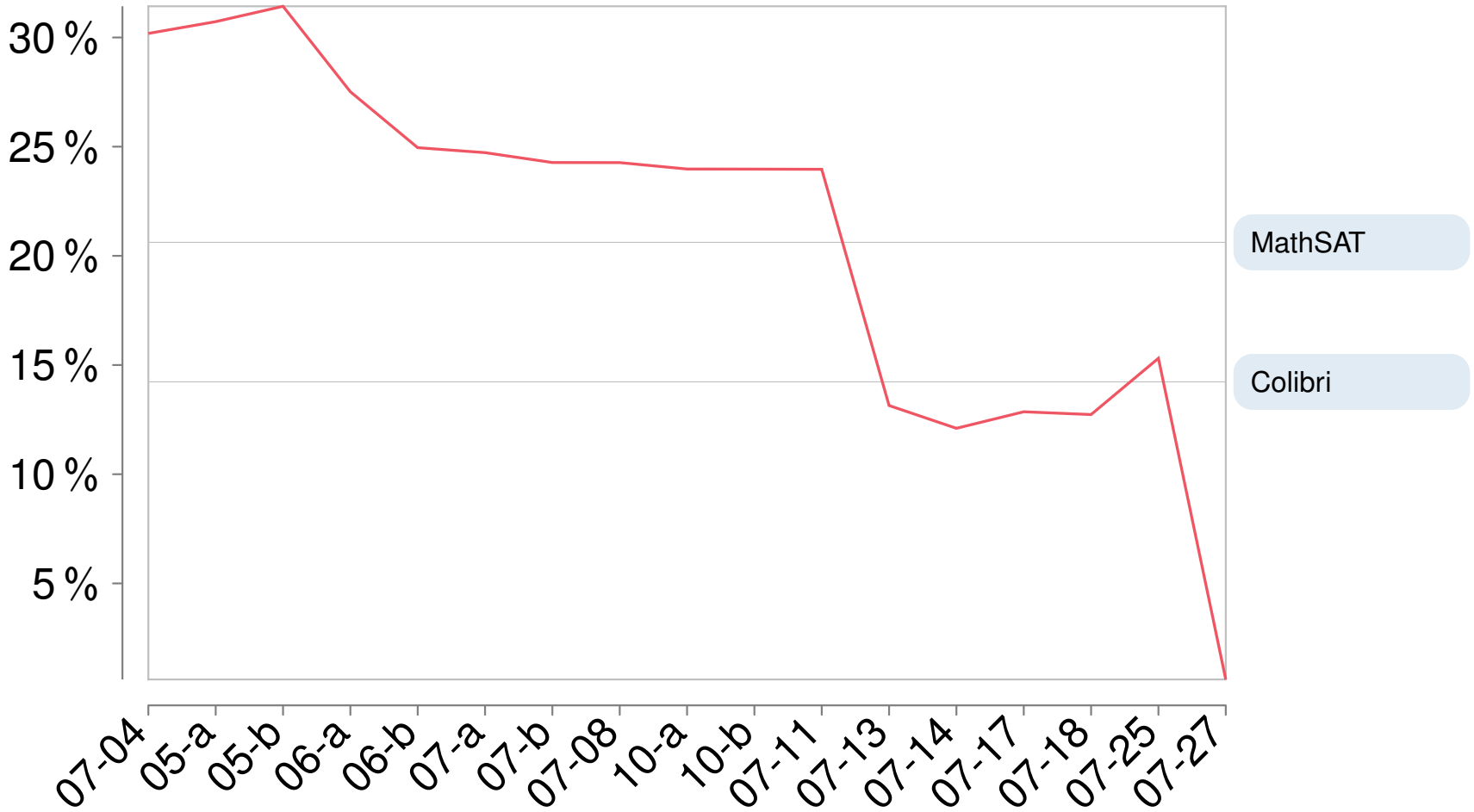
FP progress in CVC4

Error over time (average of averages)



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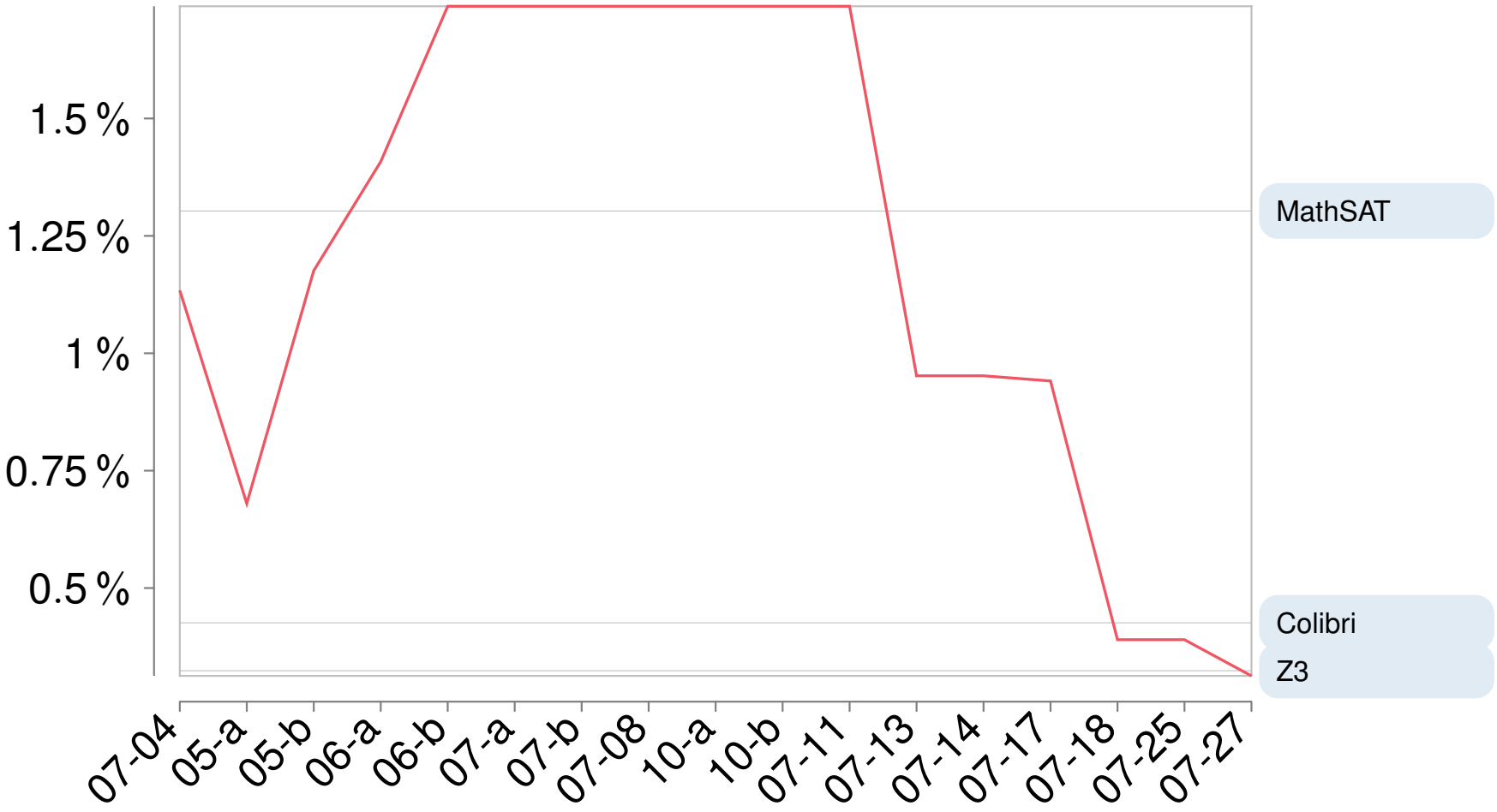
FP progress in CVC4

Unsound over time (average of averages)



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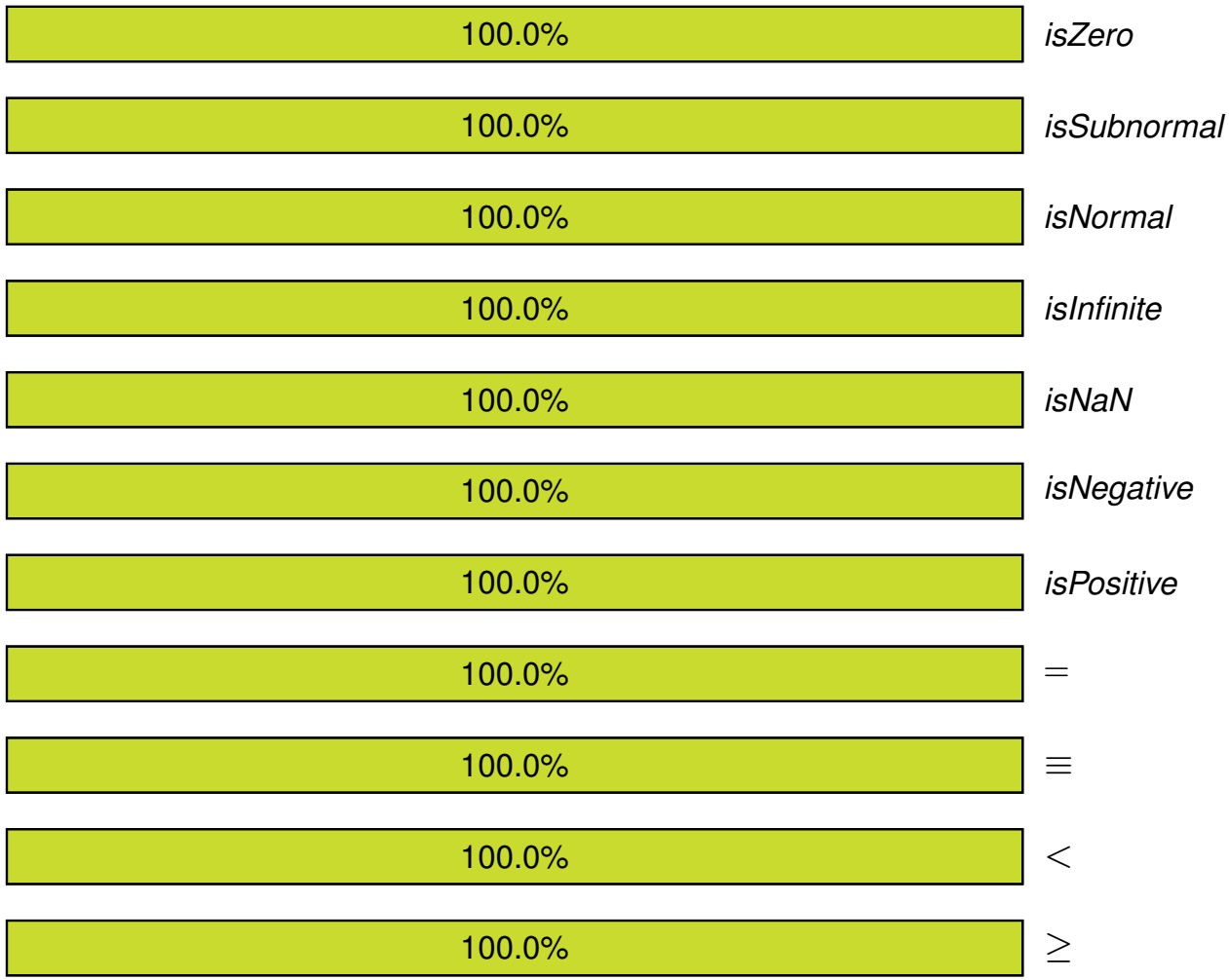
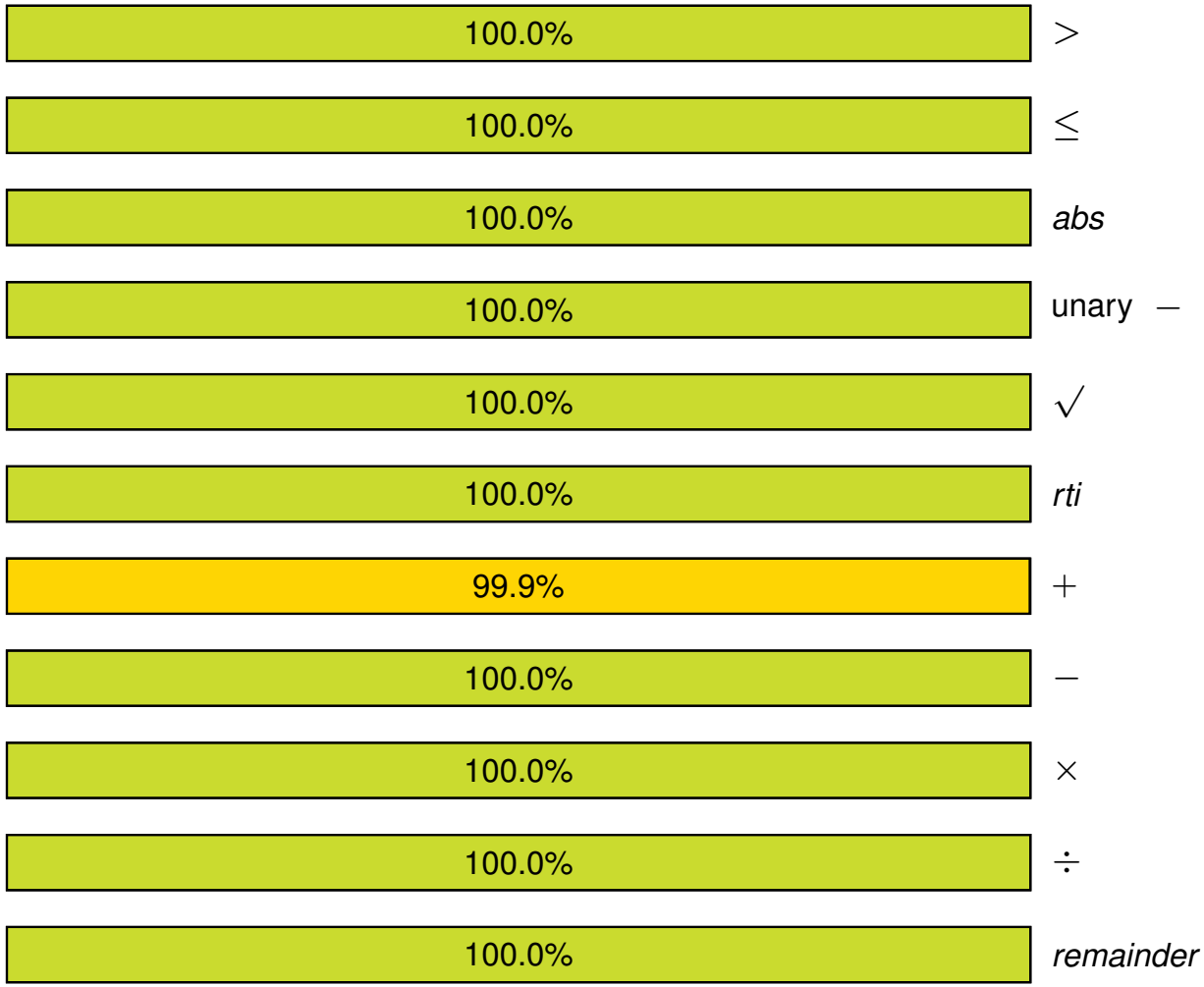
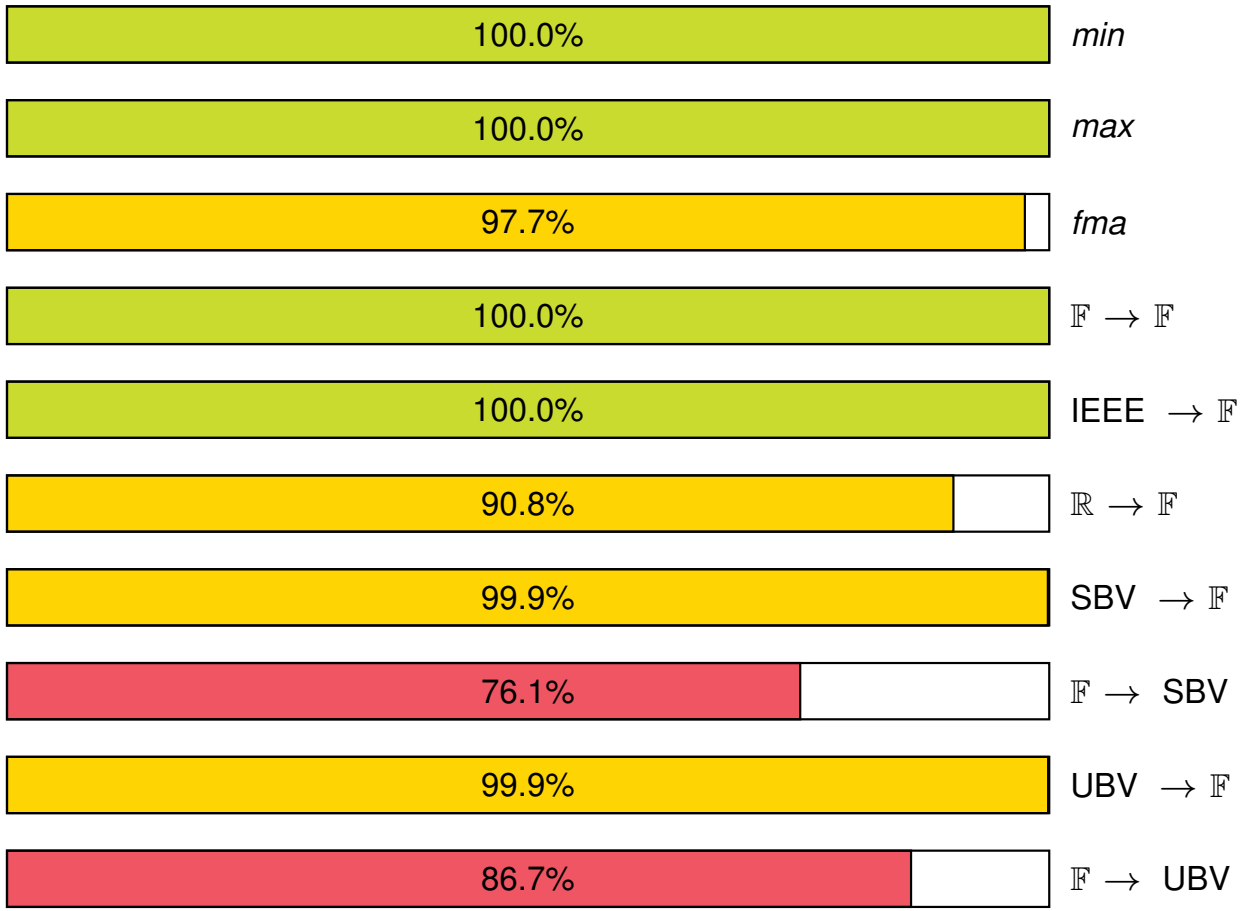
Critical Success Factors for CVC4



Critical Success Factors for CVC4



Critical Success Factors for CVC4



2.

Comparisons

Benchmarks

With status ‘solved’

Benchmark	Alt-Ergo 1.3	Colibri	CVC4	MathSAT	MathSAT (ACDL)	Z3
Schanda		78.1%	67.4%	72.5%*	28.7%*	84.3%
Griggio		63.6%	17.3%	39.7%	22.9%	30.4%
Heizmann		12.1%	69.1%	58.5%	26.6%	31.9%
Industrial_1	66.0%*		71.3%			74.3%
Industrial_1_qf	26.9%*	95.1%	96.3%	86.9%	75.4%	97.0%
NyxBrain		99.2%	99.8%	95.4%	95.0%	99.9%
PyMPF		83.5%	97.4%	30.9%	26.4%	98.9%
SPARK 2014	54.3%*		79.0%		0.0%	82.5%*
SPARK QF		95.1%	86.2%	79.7%	70.2%	90.3%
Wintersteiger		✓	99.9%	85.8%	85.8%	✓
Summary	49%	78%	78%	69%	48%	79%

*) uses different VCs

Benchmarks

With status ‘timeout’

Benchmark	Alt-Ergo 1.3	Colibri	CVC4	MathSAT	MathSAT (ACDL)	Z3
Schanda		21	55	23*	51*	23
Griggio		77	177	129	165	149
Heizmann		0	14	0	2	141
Industrial_1	91*		73			69
Industrial_1_qf	0*	7	10	0	28	8
NyxBrain		0	96	20	128	56
PyMPF		0	6	0	0	0
SPARK 2014	1127*		314		1	357*
SPARK QF		65	289	48	306	202
Wintersteiger		0	0	0	0	0
Summary	27%	7%	18%	9%	14%	20%

*) uses different VCs

Benchmarks

With status ‘error’

Benchmark	Alt-Ergo 1.3	Colibri	CVC4	MathSAT	MathSAT (ACDL)	Z3
Schanda		10	2	18*	42*	✓
Griggio		1	✓	✓	✓	✓
Heizmann		182	2	86	150	✓
Industrial_1	✓*		3			✓
Industrial_1_qf	✓*	5	✓	35	38	✓
NyxBrain		388	4	64	120	4
PyMPF		8758	45	38671	38671	✓
SPARK 2014	✓*		15		2467	✓*
SPARK QF		47	52	452	429	✓
Wintersteiger		✓	✓	5668	5668	✓
Summary	0%	14%	1%	21%	34%	0%

*) uses different VCs

Benchmarks

With status ‘unsound’

Benchmark	Alt-Ergo 1.3	Colibri	CVC4	MathSAT	MathSAT (ACDL)	Z3
Schanda		4	1	8*	34*	4
Heizmann		✓	✓	✓	✓	✓
NyxBrain		6	✓	2318	2366	12
PyMPF		658	1427	866	3408	553
SPARK 2014	✓*		✓		✓	✓*
Wintersteiger		✓	28	✓	1	✓
Summary	0%	0%	0%	1%	3%	0%

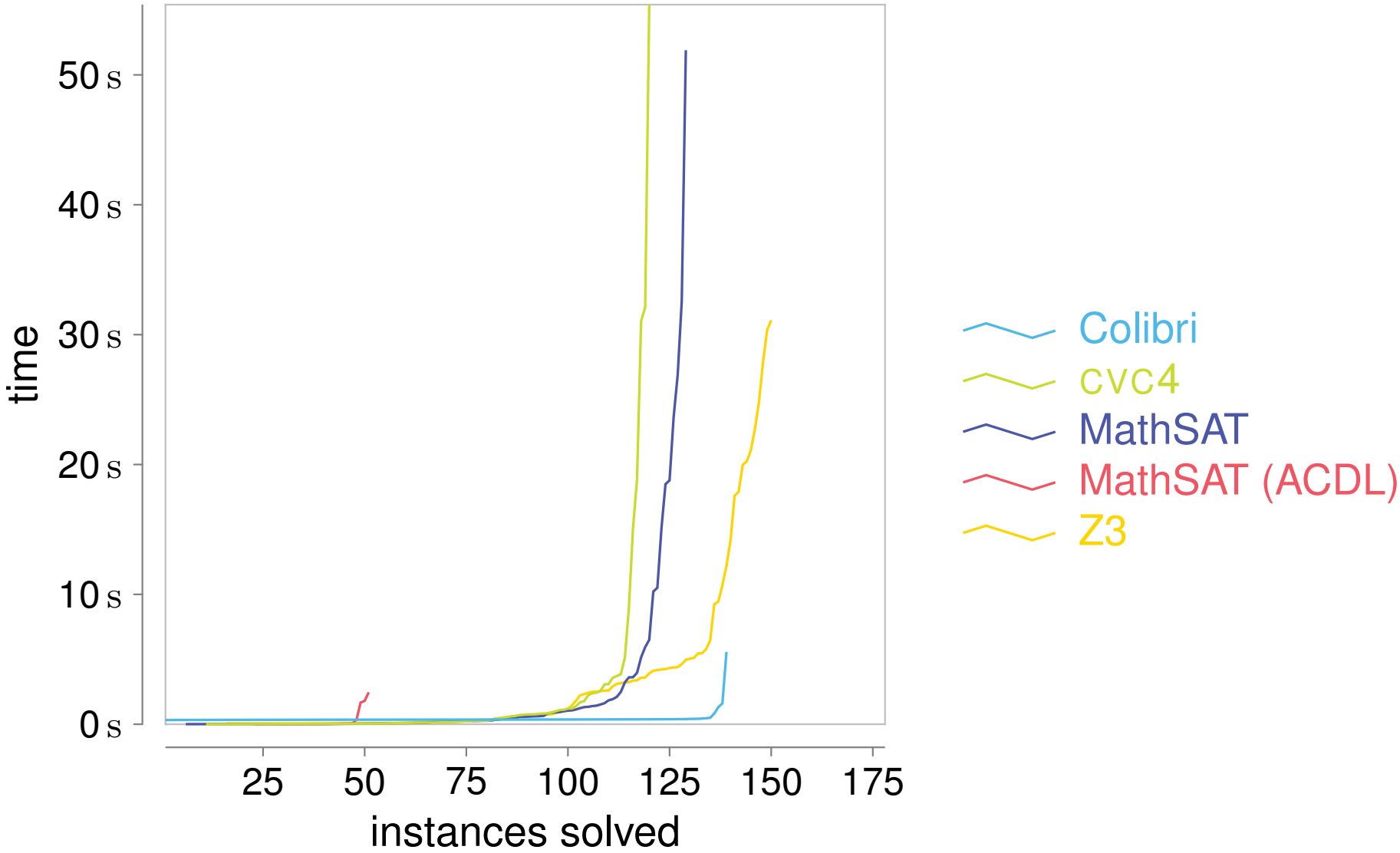
*) uses different VCs

3.

Cactus plots

Cactus plot

Schanda



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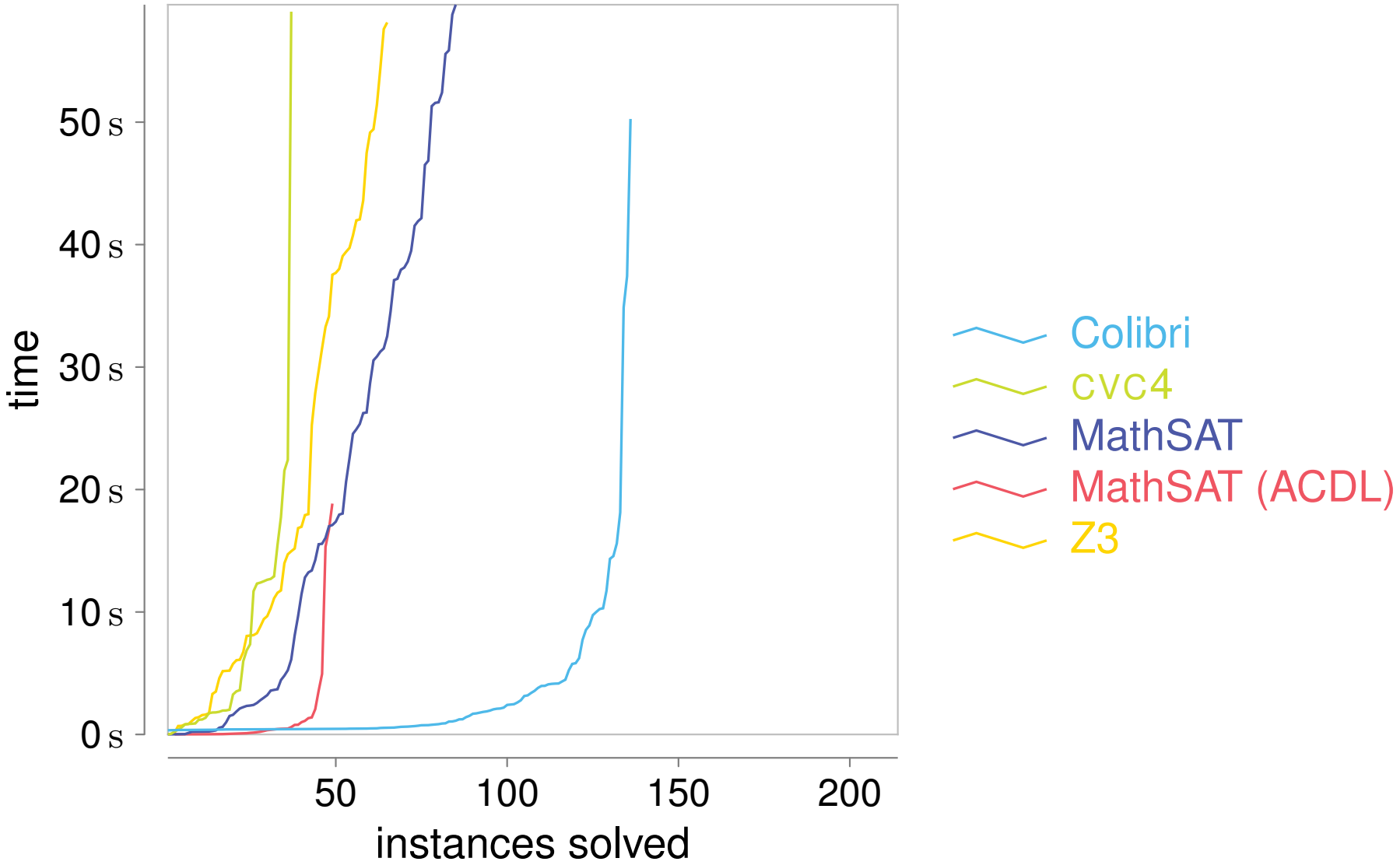
Cactus plot

Griggio



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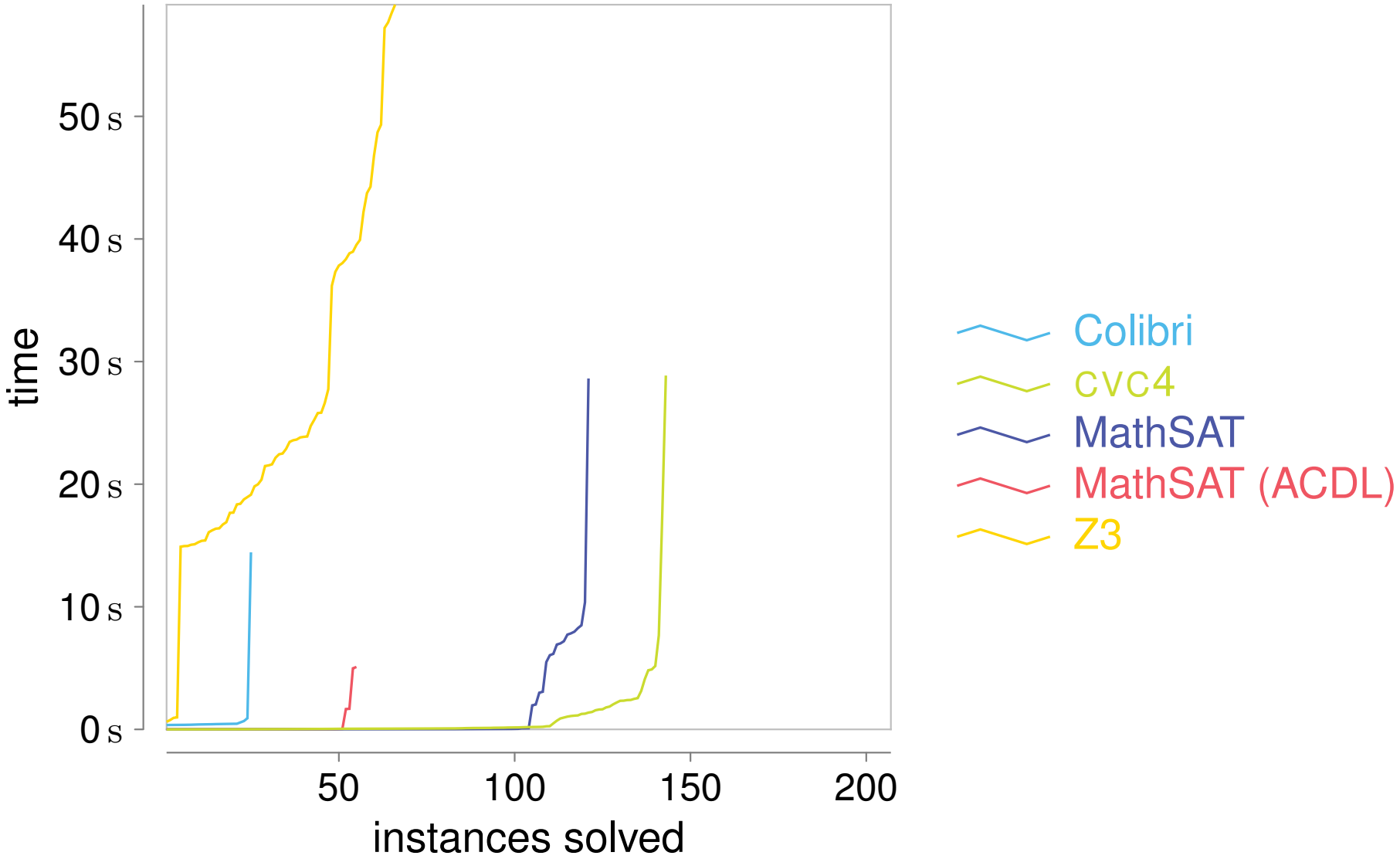
Cactus plot

Heizmann



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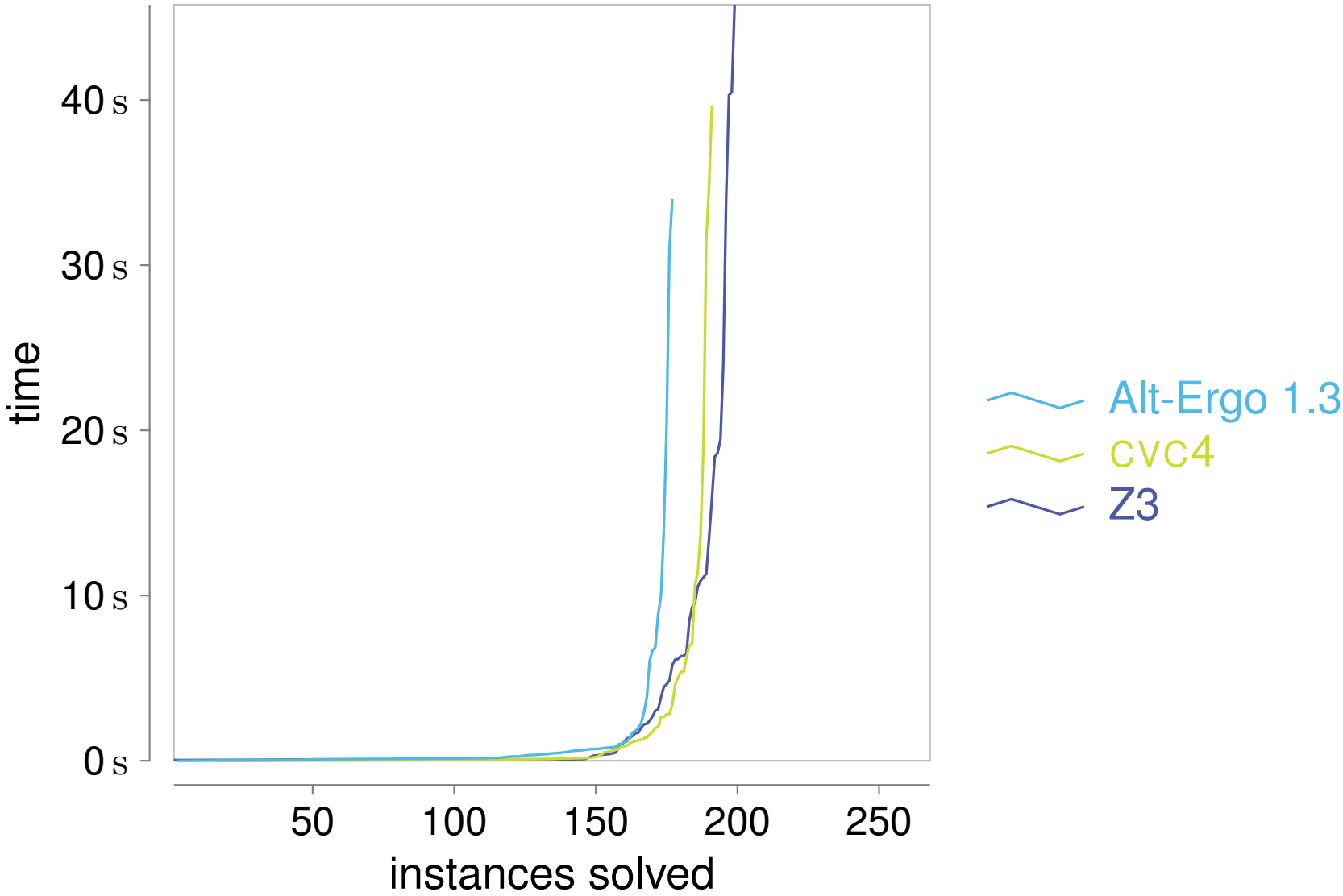
Cactus plot

Industrial_1



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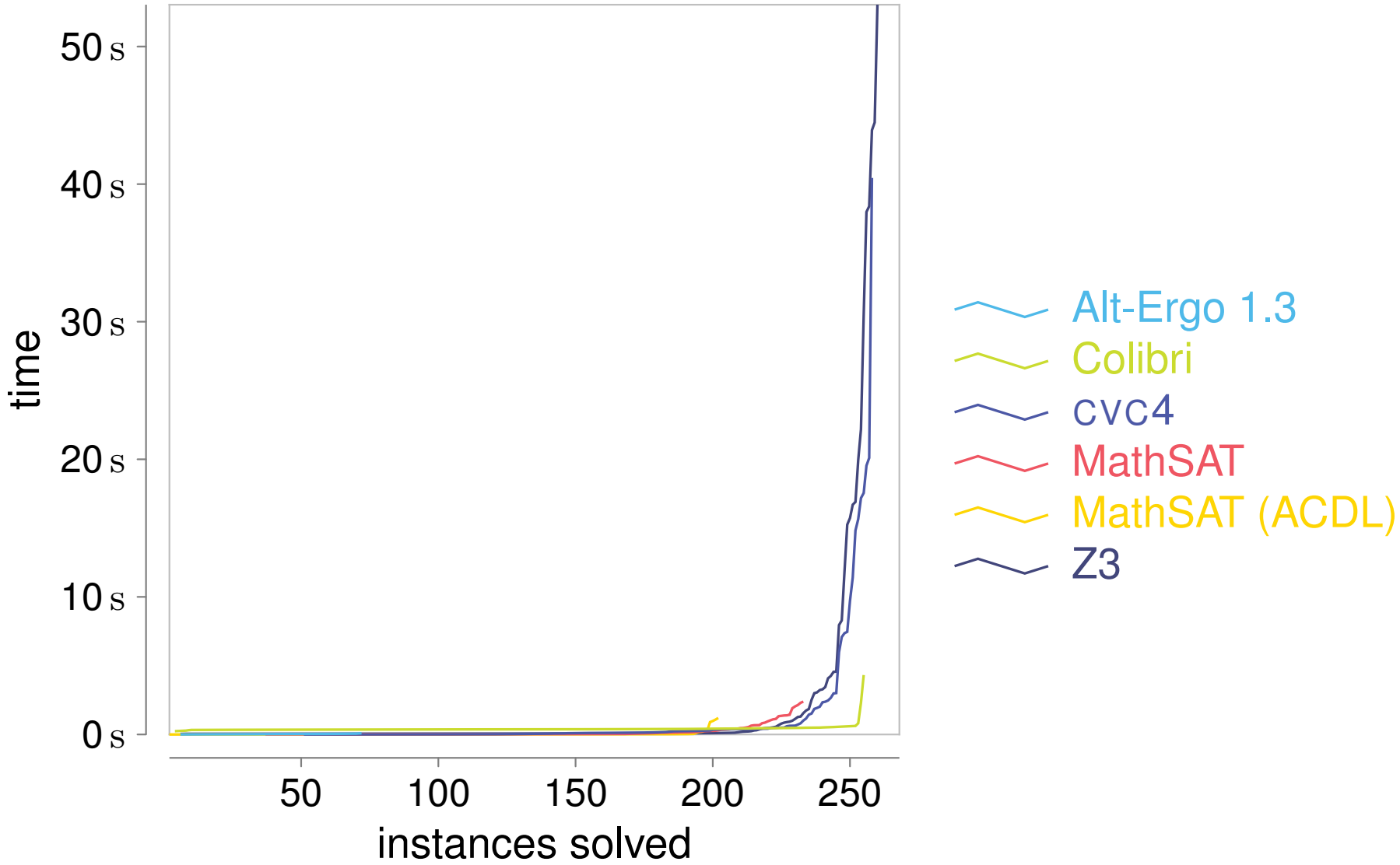
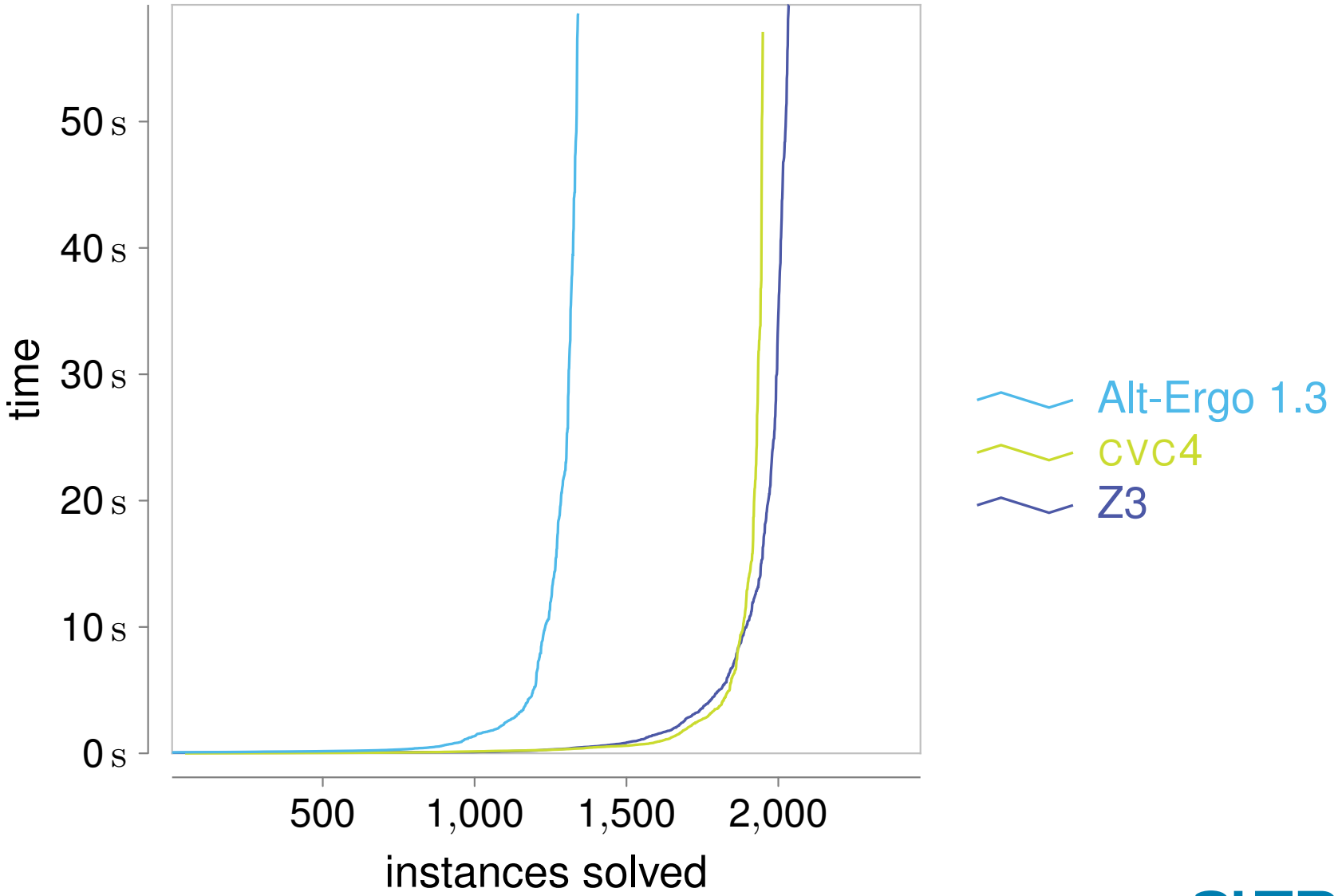
Cactus plot

Industrial_1_qf



Cactus plot

SPARK 2014



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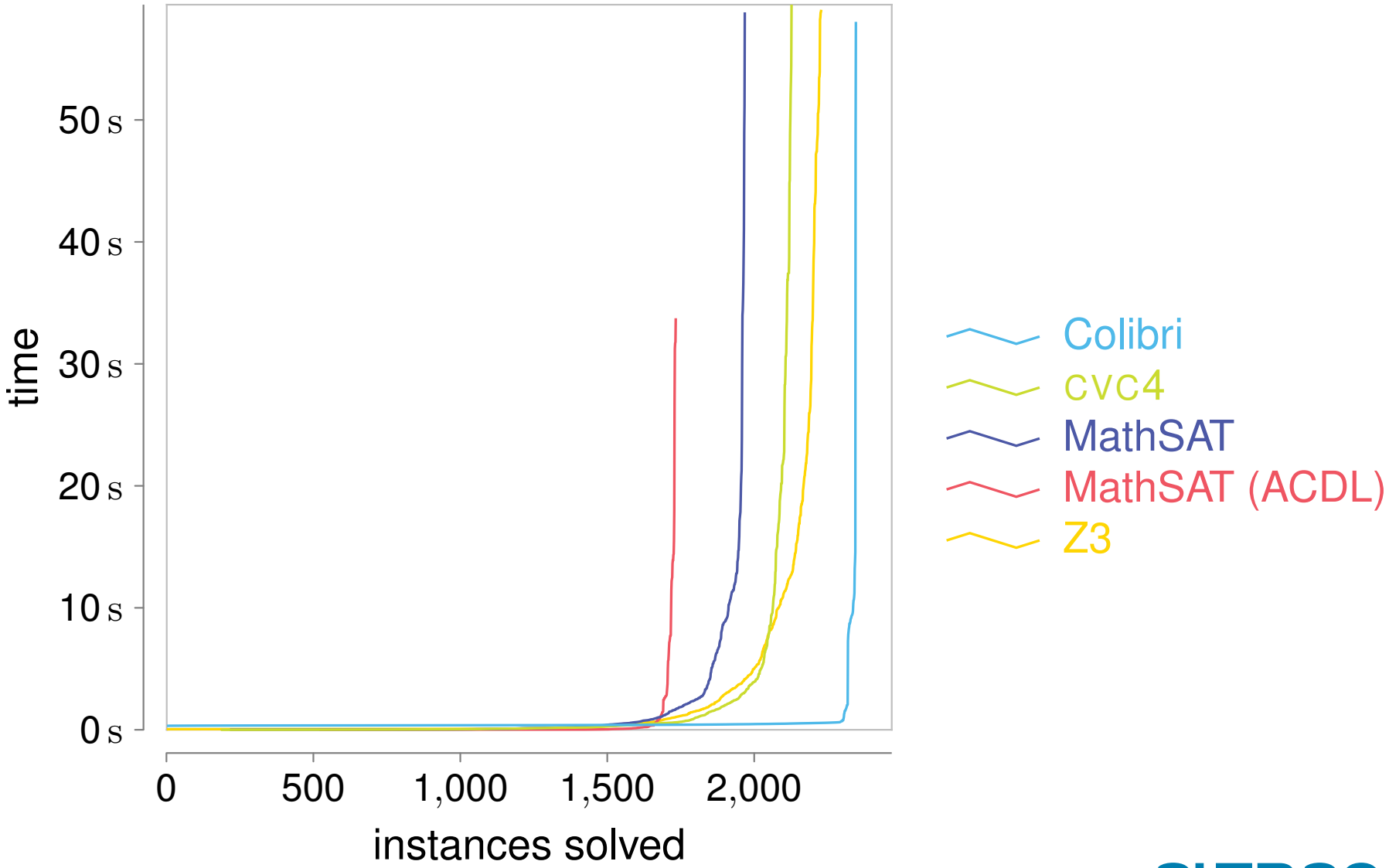
Cactus plot

SPARK QF



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