Table 1: Comparison of different tools on $BHive_U$ and $BHive_L$

		$BHive_U$		$BHive_L$	
μArch	**Predictor**	**MAPE**	**Kendall**	**MAPE**	**Kendall**
RKL	uiCA	0.49%	0.9835	0.92%	0.9755
	CQA 2.16.0			5.69%	0.9123
	Baseline	15.50%	0.7397	9.26%	0.7808
TGL	uiCA	0.97%	0.9769	0.98%	0.9731
	llvm-mca-10	25.74%	0.7049	13.80%	0.8486
	CQA 2.16.0			5.44%	0.9139
	Baseline	17.49%	0.7245	11.25%	0.7413
ICL	uiCA	1.00%	0.9771	0.77%	0.9759
	OSACA	53.80%	0.3143	21.98%	0.4698
	llvm-mca-10	25.38%	0.7030	13.64%	0.8512
	CQA 2.16.0			5.03%	0.9256
	Baseline	17.54%	0.7230	10.84%	0.7510
CLX	uiCA	0.45%	0.9713	0.65%	0.9825
	llvm-mca-10	23.17%	0.7211	13.21%	0.8060
	OSACA	20.83%	0.7511	11.61%	0.8068
	Baseline	15.49%	0.7461	10.31%	0.8021
SKL	uiCA	0.45%	0.9798	0.38%	0.9895
	Ithemal	8.28%	0.8172	13.66%	0.7582
	IACA 3.0	13.49%	0.7802	14.26%	0.8290
	IACA 2.3	11.85%	0.8071	8.42%	0.8477
	OSACA	14.95%	0.7639	11.25%	0.8045
	llvm-mca-10	15.61%	0.7258	12.01%	0.8015
	llvm-mca-8	15.39%	0.7434	11.98%	0.8021
	DiffTune	24.48%	0.6626	104.88%	0.6426
	CQA 2.16.0			6.58%	0.8972
	Measured (orig.)	4.40%	0.9113		
	Baseline	17.28%	0.7228	10.03%	0.7999
BDW	uiCA	1.08%	0.9805	0.60%	0.9841
	IACA 3.0	14.69%	0.8012	11.47%	0.8725
	IACA 2.3	13.22%	0.8206	5.84%	0.8928
	OSACA	17.52%	0.7456	9.69%	0.8365
	llvm-mca-10	14.23%	0.7793	16.71%	0.8286
	CQA 2.16.0			5.00%	0.9222
	Baseline	16.97%	0.7572	7.44%	0.8332
HSW	uiCA	0.76%	0.9850	0.59%	0.9842
	Ithemal	7.38%	0.8400	16.19%	0.7700
	IACA 3.0	15.04%	0.8080	12.00%	0.8733
	IACA 2.3	13.13%	0.8291	5.79%	0.8925
	OSACA	17.84%	0.7463	9.77%	0.8307
	llvm-mca-10	20.29%	0.7835	18.97%	0.8259
	llvm-mca-8	21.08%	0.7784	19.46%	0.8171
	DiffTune	24.80%	0.6997	138.47%	0.6925
	CQA 2.16.0			5.05%	0.9229
	Measured (orig.)	2.49%	0.9379		
	Baseline	17.30%	0.7604	7.57%	0.8314
IVB	uiCA	1.50%	0.9609	1.11%	0.9495
	Ithemal	7.08%	0.8212	12.43%	0.7785
	IACA 2.3	13.94%	0.7739	11.54%	0.8271
	OSACA	36.23%	0.4884	24.88%	0.5846
	llvm-mca-10	22.79%	0.7656	20.76%	0.8154
	llvm-mca-8	22.93%	0.7622	20.76%	0.8138
	DiffTune	26.21%	0.6470	82.94%	0.7516
	CQA 2.16.0			4.05%	0.9174
	Measured (orig.)	2.53%	0.9139		
	Baseline	18.81%	0.7243	14.47%	0.7670
SNB	uiCA	1.91%	0.9613	0.98%	0.9650
	IACA 2.3	11.91%	0.8194	9.95%	0.8482
	OSACA	36.86%	0.5311	24.75%	0.5659
	llvm-mca-10	22.67%	0.8069	18.34%	0.8455
	CQA 2.16.0			4.07%	0.9238
	Baseline	20.28%	0.7517	15.56%	0.7577

Table 2: Influence of the simulation of different microarchitectural components on the prediction accuracy

		$BHive_U$		$BHive_L$	
μArch	**Predictor**	**MAPE**	**Kendall**	**MAPE**	**Kendall**
CLX (all benchmarks)	uiCA	0.45%	0.9713	0.65%	0.9825
	uiCA with simple front end	8.57%	0.8602	6.23%	0.9048
	uiCA with simple port assignment	2.37%	0.9280	12.20%	0.8613
	uiCA without micro fusion	8.77%	0.8683	3.31%	0.9545
	uiCA without macro fusion	0.48%	0.9699	8.84%	0.8863
	uiCA without LSD unrolling	0.45%	0.9713	6.72%	0.9246
	Baseline	15.49%	0.7461	10.31%	0.8021
CLX (benchmarks with moves)	uiCA	0.44%	0.9801	0.45%	0.9836
	uiCA without move elimination	1.79%	0.9654	1.74%	0.9615
	uiCA with full move elimination	0.52%	0.9793	0.48%	0.9846
	Baseline	12.99%	0.8352	9.77%	0.8636

A HEATMAPS FOR ICE LAKE

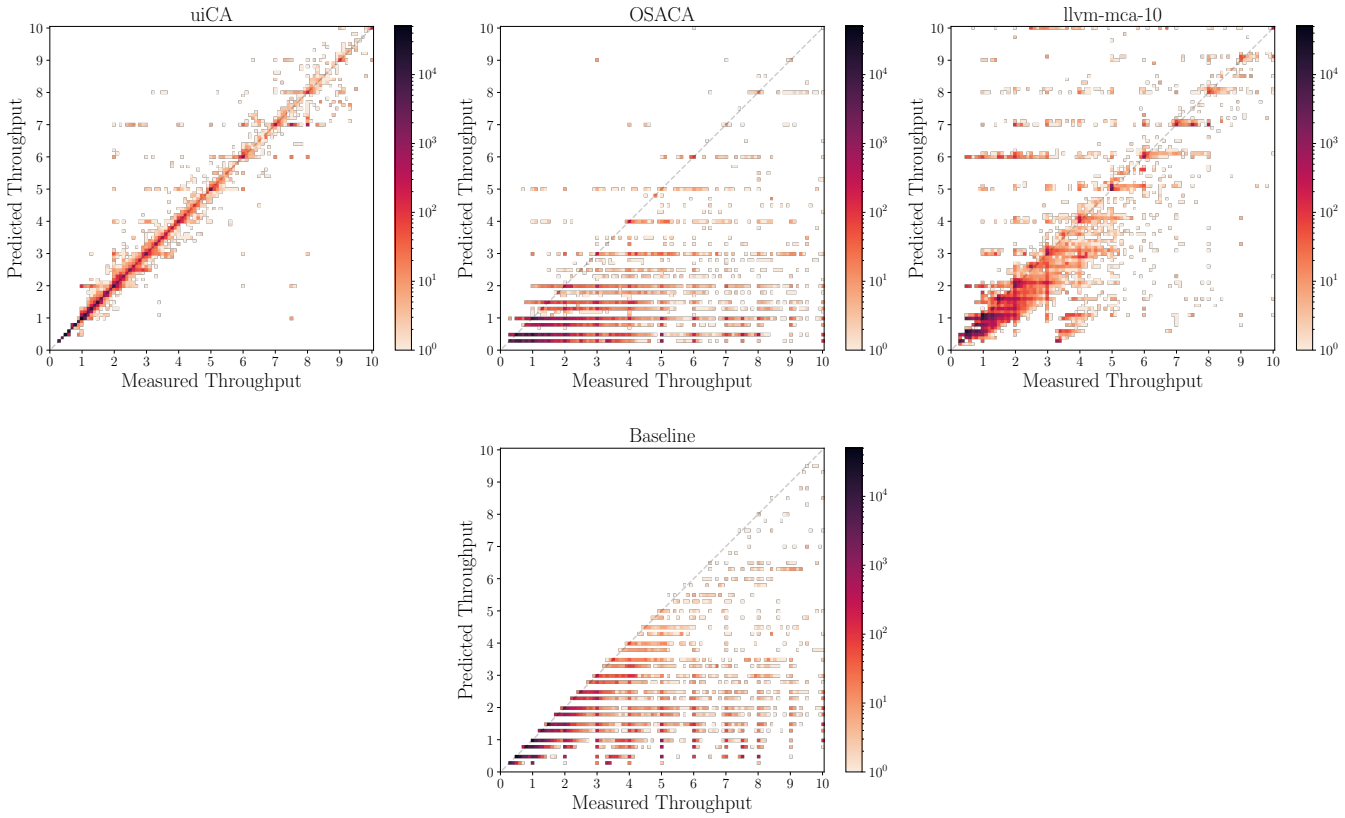

Figure 1: Heatmaps for $BHive_U$ for basic blocks with a measured throughput of less than 10 cycles/iteration on Ice Lake

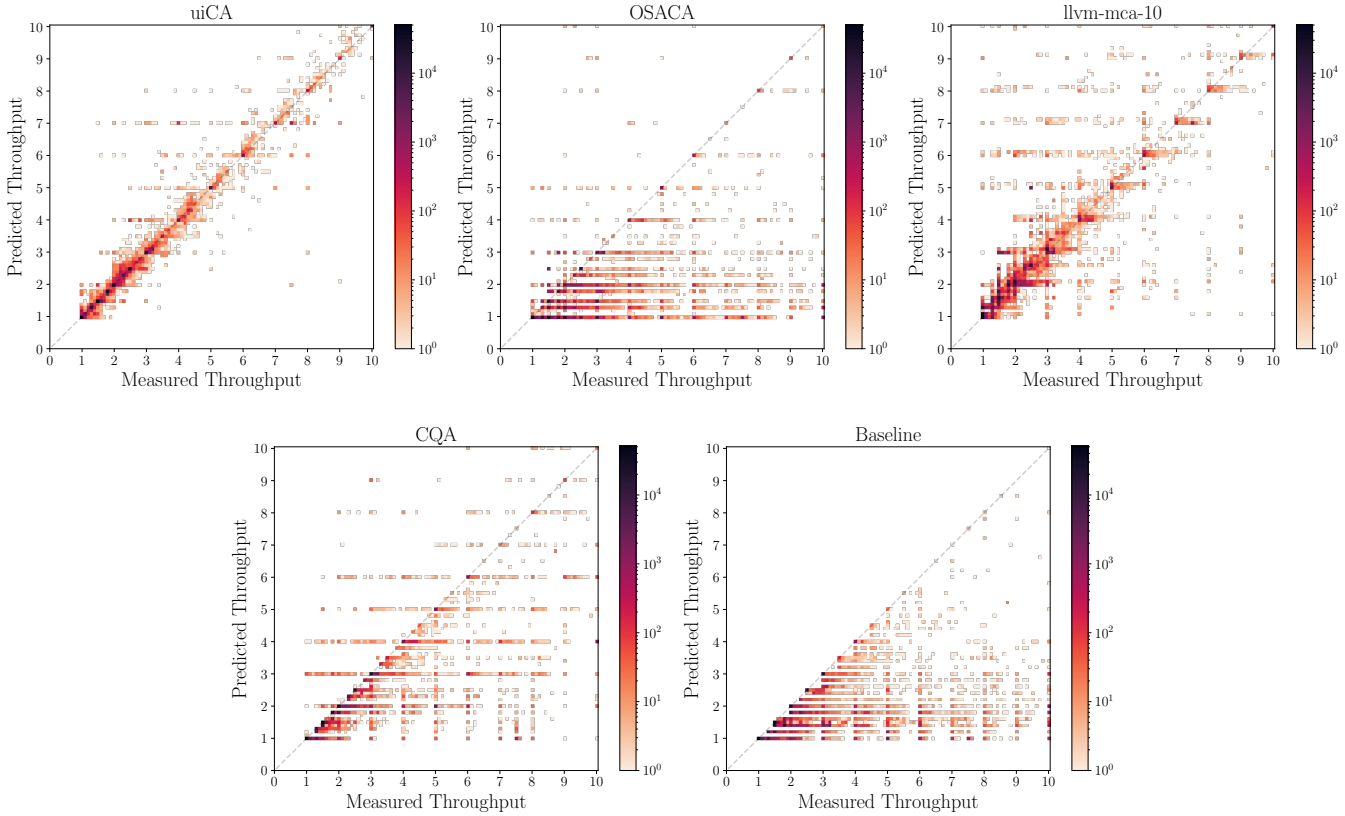

Figure 2: Heatmaps for $BHive_L$ for basic blocks with a measured throughput of less than 10 cycles/iteration on Ice Lake

B HEATMAPS FOR SKYLAKE

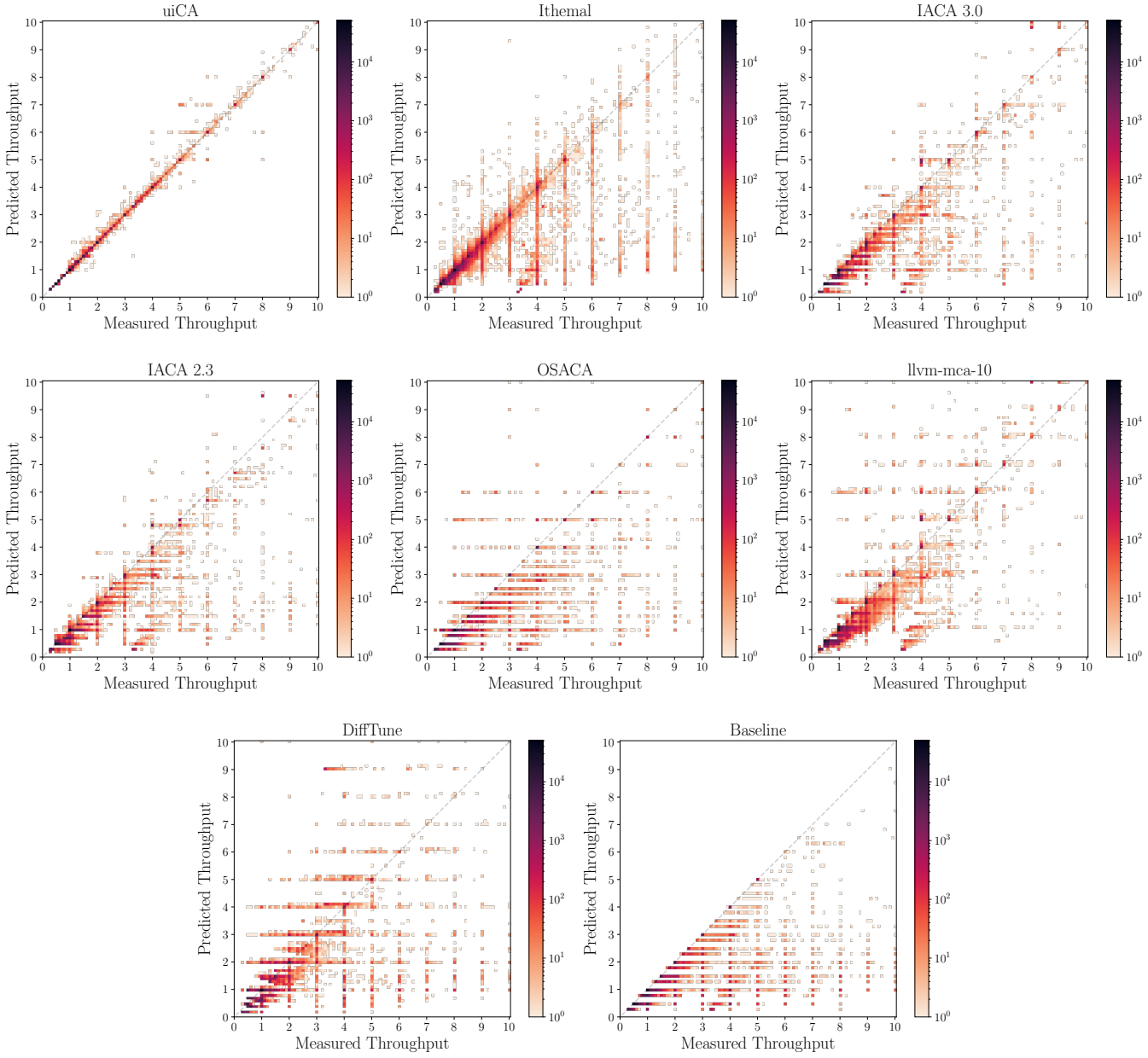

Figure 3: Heatmaps for $BHive_U$ for basic blocks with a measured throughput of less than 10 cycles/iteration on Skylake

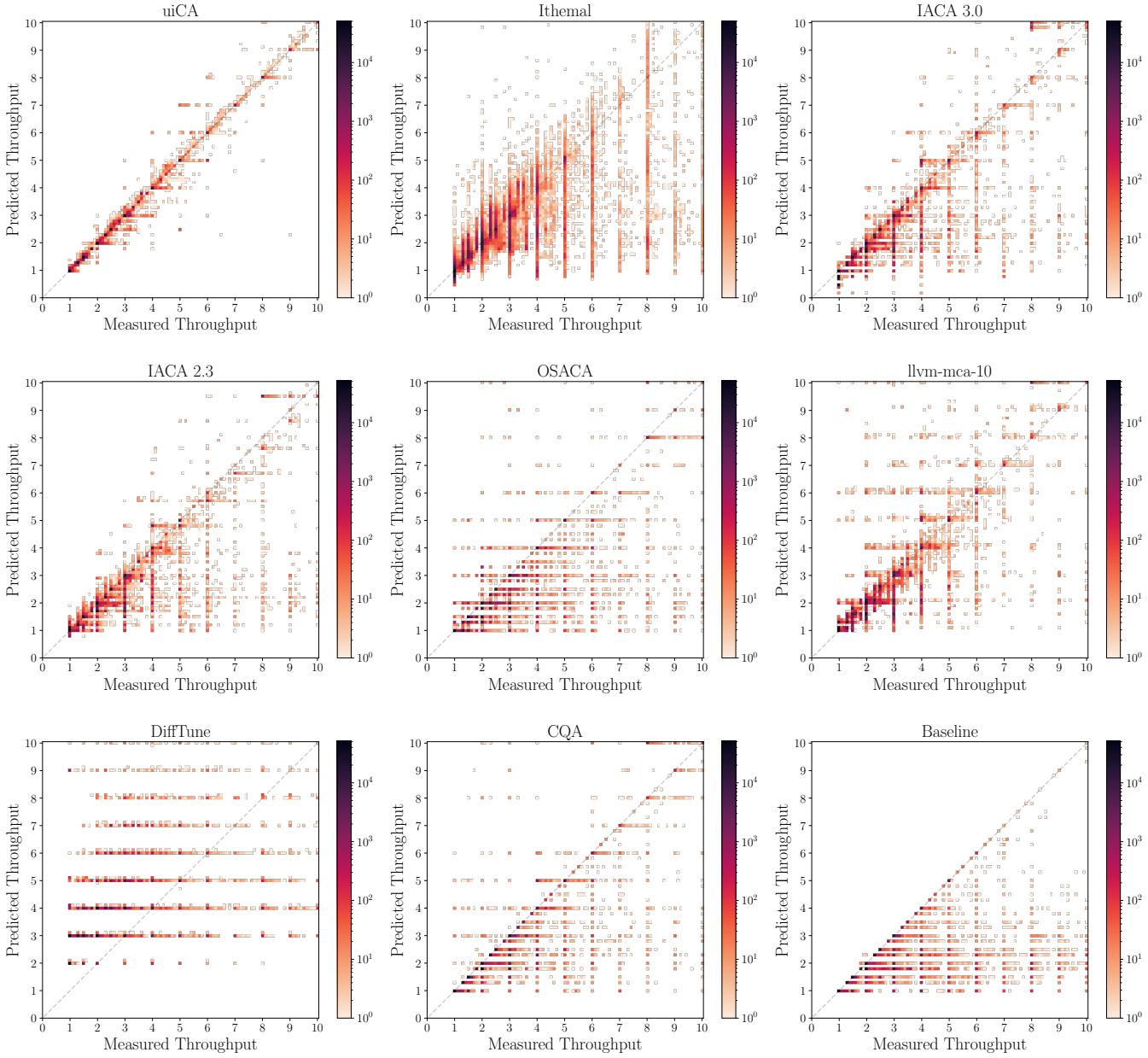

Figure 4: Heatmaps for $BHive_L$ for basic blocks with a measured throughput of less than 10 cycles/iteration on Skylake

C HEATMAPS FOR HASWELL

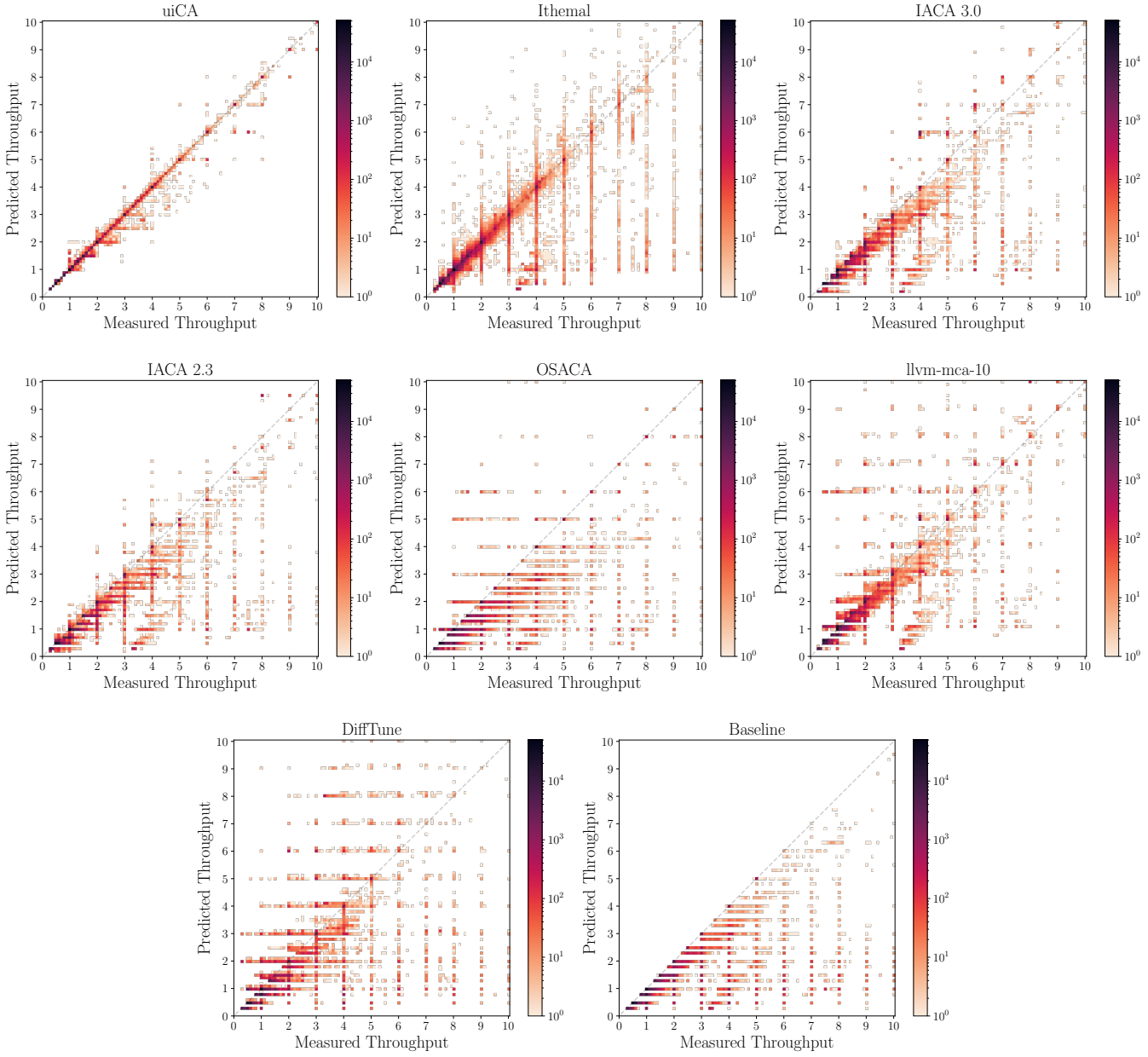

Figure 5: Heatmaps for $BHive_U$ for basic blocks with a measured throughput of less than 10 cycles/iteration on Haswell

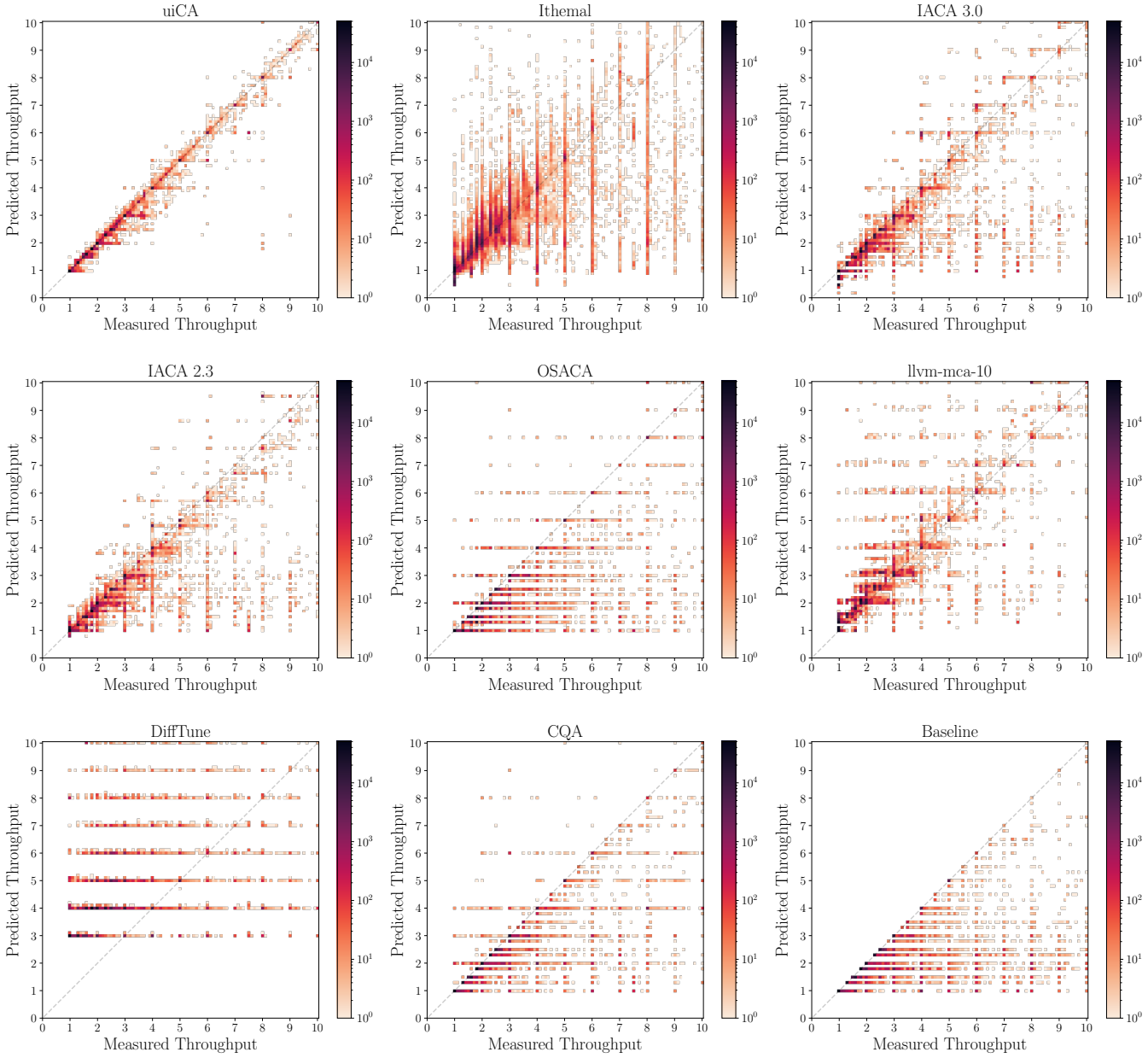

Figure 6: Heatmaps for $BHive_L$ for basic blocks with a measured throughput of less than 10 cycles/iteration on Haswell

D HEATMAPS FOR IVY BRIDGE

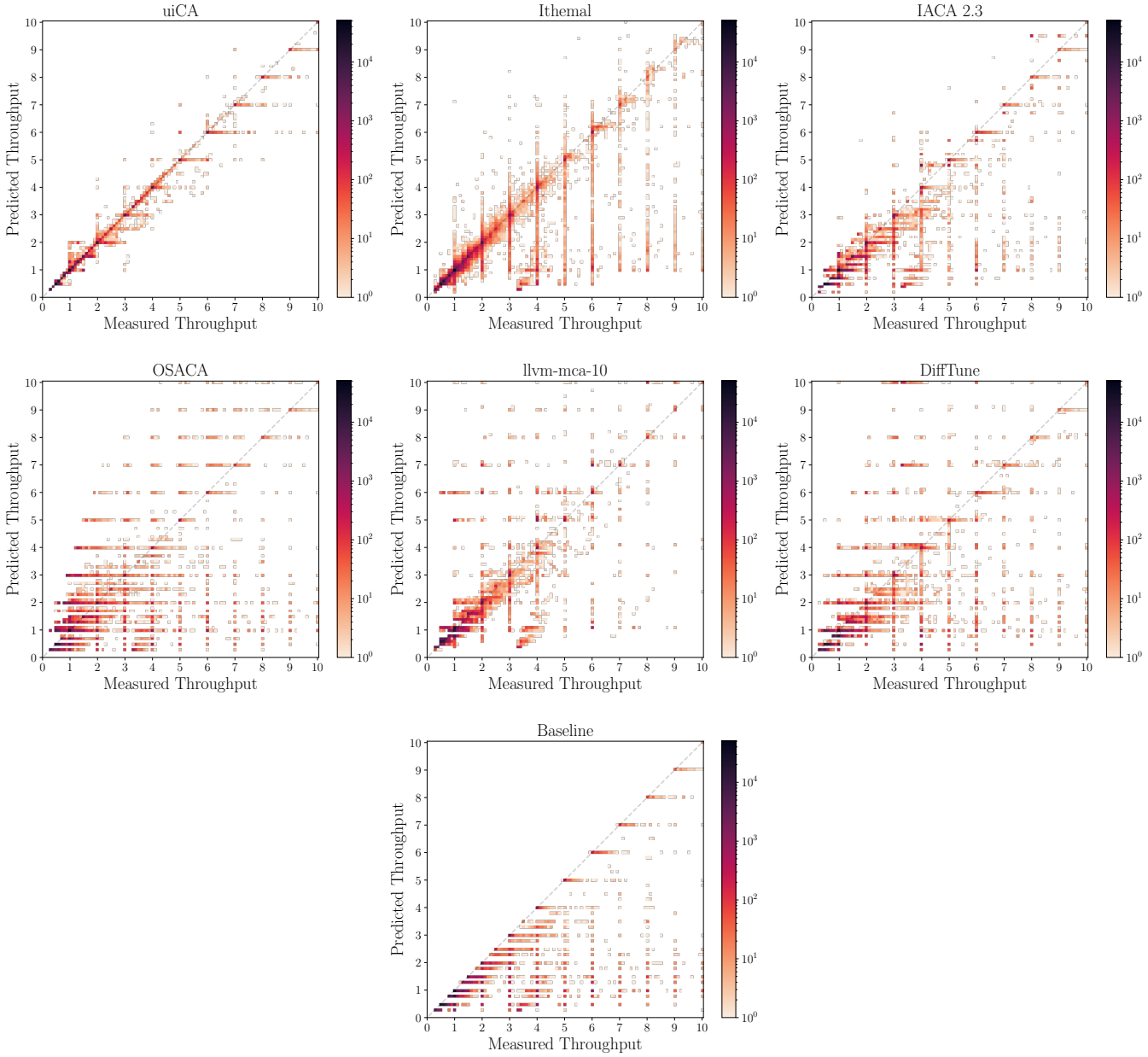

Figure 7: Heatmaps for $BHive_U$ for basic blocks with a measured throughput of less than 10 cycles/iteration on Ivy Bridge

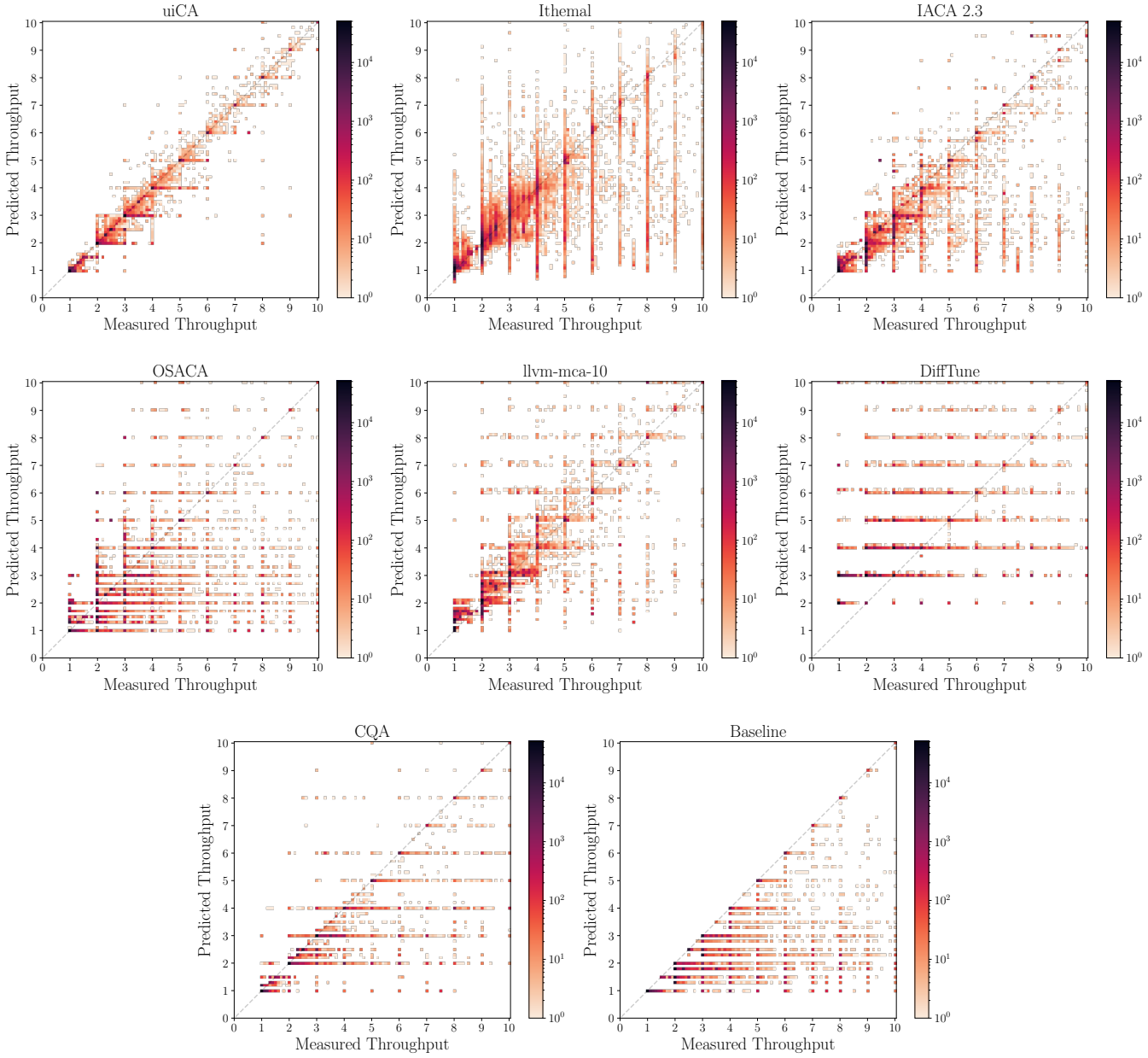

Figure 8: Heatmaps for $BHive_L$ for basic blocks with a measured throughput of less than 10 cycles/iteration on Ivy Bridge