Qiskit QAOA performance on MaxCut QAOA with and without noise

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Overview

1. **Butterfly**
   Noiseless
   With noise

2. **Diamond graph**
   Noiseless
   With noise

Butterfly graph, on qasm simulator

p	iter (avg)	iter (std)	t (mean) [s]	t (std) [s]	obj (mean)	obj (max)	obj (min)	E (mean)	E (std)
1	84.8	17.55	2.229	0.379	4.0	4.0	4.0	-0.92876	$1.15 \cdot 10^{-9}$
2	338.4	61.7	11.65	2.49	4.0	4.0	4.0	-0.98909	0.00587
3	855.4	244.9	29.7	9.2	4.0	4.0	4.0	-0.98878	0.02295
4	923.1	163.0	41.6	7.8	4.0	4.0	4.0	-0.99272	0.01078
5	794.3	204.6	31.7	7.66	4.0	4.0	4.0	-0.99736	0.00634

Table: Without noise, 10 runs per p

p	iter (avg)	iter (std)	t (mean) [s]	t (std) [s]	obj (mean)	obj (max)	obj (min)	E (mean)	E (std)
1	1003	-	1082	-	4.0	4.0	4.0	-0.83890	-

Table: With noise, 1 run per p

Diamond graph, on qasm simulator

p	iter (avg)	iter (std)	t (mean) [s]	t (std) [s]	obj (mean)	obj (max)	obj (min)	E (mean)	E (std)
1	79.2	15.6	1.843	0.343	4.0	4.0	4.0	-0.69174	0.0730
2	331.3	105.8	8.15	2.72	4.0	4.0	4.0	-0.94124	0.14950
3	900.7	159.2	23.4	4.19	4.0	4.0	4.0	-1.0959	0.02212
4	1000.2	0.42	27.15	0.094	4.0	4.0	4.0	-1.2658	0.22596
5	1000.4	0.52	29.38	0.43	4.0	4.0	4.0	-1.46799	0.03789

Table: Without noise, 10 runs per p

p	iter (avg)	iter (std)	t (mean) [s]	t (std) [s]	obj (mean)	obj (max)	obj (min)	E (mean)	E (std)
1	1000	-	1038	-	4.0	4.0	4.0	-0.63682	-

Table: With noise, 1 run per p