

VQD using IBM Backends												
Matrix Qubits	Ansatz Qubits	Ansatz Type	Classical optimi	Circuit Paramet	Rotation Blocks	Shots	Backend	Ground State Relative Error	Excited State Relative Error			
1	1	RA	SPSA(150)	3	Ry	10	ibmq-qasm-simulator	0	0			
1	1	RA	SPSA(100)	2	Ry	10	ibmq-qasm-simulator	0	0			
1	1	RA	CG(100)	2	Ry	10	ibmq-qasm-simulator	0	9.2211			
1	1	RA	AQGD	2	Ry	10	ibmq-qasm-simulator	4.2645	9.8793			
1	1	RA	COBYLA	2	Ry	10	ibmq-qasm-simulator	0	0			
1	1	RA	GSLS	2	Ry	10	ibmq-qasm-simulator	0	9.2211			
1	1	RA	GD	2	Ry	10	ibmq-qasm-simulator	0	9.2211			
1	1	RA	NELDER_MEAD	2	Ry	10	ibmq-qasm-simulator	0	9.2211			
1	1	RA	NFT [1]	2	Ry	10	ibmq-qasm-simulator	0	0			
1	1	RA	POWELL [2]	2	Ry	10	ibmq-qasm-simulator	0	0			
1	1	RA	SLSQP	2	Ry	10	ibmq-qasm-simulator	0	9.2211			
1	1	RA	UMDA	2	Ry	10	ibmq-qasm-simulator	failed	failed			
1	1	RA	TNC [3]	2	Ry	10	ibmq-qasm-simulator	0	9.2211			
1	1	RA	L_BFGS_B	2	Ry	10	ibmq-qasm-simulator	0	9.2211			
1	1	RA	ADAM	2	Ry	10	ibmq-qasm-simulator	0	9.2211			
1	1	RA	P_BFGS	2	Ry	10	ibmq-qasm-simulator	failed	failed			
2	2	RA	SPSA(500)	4	Ry	1000	ibmq-qasm-simulator	0.8918	3.3477			
	COMMENT: What's more expensive - diagonalizing a sparsepauliOp or diagonalizing a sparse matrix?											
	COMMENT: Can a sparsePauliOp be truncated? What happens to the accuracy? [4]											
	COMMENT: Optimizers function differently depending on the backend used [5]											

[1] took too long to converge

[2] finished quickly

[3] fast convergence

[4] see sheet 3

[5] see sheet 3