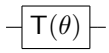
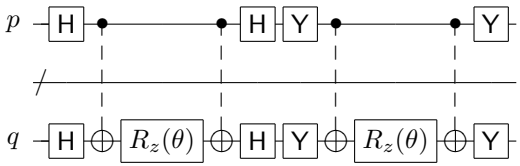
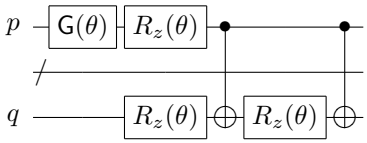
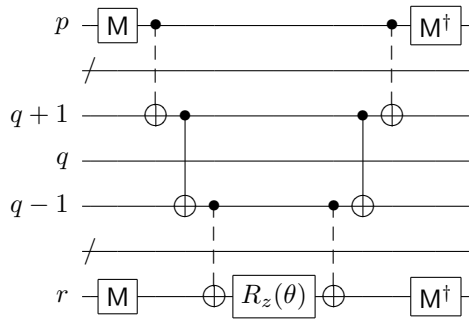
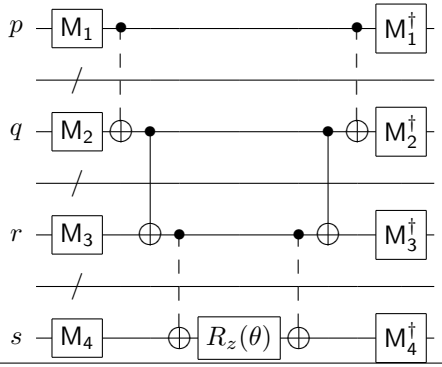
Second quantized operators		Circuit
Number operator	$h_{pp}a_p^\dagger a_p$	
Excitation operator	$h_{pq}(a_p^\dagger a_q + a_q^\dagger a_p)$	
Coulomb and exchange operators	$h_{pqqp}a_p^\dagger a_q^\dagger a_q a_p$	
Number-excitation[1] operator	h_{pqqr} $(a_p^\dagger a_q^\dagger a_q a_r + a_r^\dagger a_q^\dagger a_q a_p)$	 where $\mathsf{M} = \{\mathsf{H}, \mathsf{Y}\}$
Double excitation operator	h_{pqrs} $(a_p^\dagger a_q^\dagger a_r a_s + a_s^\dagger a_r^\dagger a_q a_p)$	 where $(\mathsf{M}_1, \mathsf{M}_2, \mathsf{M}_3, \mathsf{M}_4)$= $\{(\mathsf{H},\mathsf{H},\mathsf{H},\mathsf{H}), (\mathsf{Y},\mathsf{Y},\mathsf{Y},\mathsf{Y}), (\mathsf{H},\mathsf{Y},\mathsf{H},\mathsf{Y}),(\mathsf{Y},\mathsf{H},\mathsf{Y},\mathsf{H}), (\mathsf{Y},\mathsf{Y},\mathsf{H},\mathsf{H}),(\mathsf{H},\mathsf{H},\mathsf{Y},\mathsf{Y}), (\mathsf{Y},\mathsf{H},\mathsf{H},\mathsf{Y}), (\mathsf{H},\mathsf{Y},\mathsf{Y},\mathsf{H})\}$
Notation: