



A quantum circuit diagram consisting of two columns of unitary operations. The first column contains four boxes labeled  $U_N(\theta_1)$ ,  $U_N(\theta_2)$ ,  $U_N(\theta_3)$ , and  $U_N(\theta_4)$  from top to bottom. The second column contains three boxes labeled  $U_N(\theta_5)$ ,  $U_N(\theta_6)$ , and  $U_N(\theta_7)$  from top to bottom. The circuit is represented by two sets of four horizontal lines, with the boxes placed between them.

$$U_N(\theta_1)$$

$$U_N(\theta_2)$$

$$U_N(\theta_3)$$

$$U_N(\theta_4)$$

$$U_N(\theta_5)$$

$$U_N(\theta_6)$$

$$U_N(\theta_7)$$