

$$\sigma_1 = \frac{0 \mid 1}{1 \mid 0}$$

$$\sigma_2 = \frac{0 \mid -i}{i \mid 0}$$

$$\sigma_3 = \frac{1 \mid 0}{0 \mid -1}$$

$\sigma_k \in {}^2\mathbb{C}_2^0$  self-adj traceless

$$\sigma_k^2 = 1$$

$$\sigma_1^2 = \frac{0 \mid 1}{1 \mid 0} \frac{0 \mid 1}{1 \mid 0} = \frac{1 \mid 0}{0 \mid 1} = 1$$

$$\sigma_2^2 = \frac{0 \mid -i}{i \mid 0} \frac{0 \mid -i}{i \mid 0} = \frac{1 \mid 0}{0 \mid 1} = 1$$

$$\sigma_3^2 = \frac{1 \mid 0}{0 \mid -1} \frac{1 \mid 0}{0 \mid -1} = \frac{1 \mid 0}{0 \mid 1} = 1$$

$$k \neq \ell: \quad \sigma_k \sigma_\ell = -\sigma_\ell \sigma_k$$

$$\sigma_1 \sigma_2 = \frac{0 \mid 1}{1 \mid 0} \frac{0 \mid -i}{i \mid 0} = \frac{i \mid 0}{0 \mid -i} : \quad \sigma_2 \sigma_1 = \frac{0 \mid -i}{i \mid 0} \frac{0 \mid 1}{1 \mid 0} = \frac{-i \mid 0}{0 \mid i}$$

$$\sigma_1 \sigma_3 = \frac{0 \mid 1}{1 \mid 0} \frac{1 \mid 0}{0 \mid -1} = \frac{0 \mid -1}{1 \mid 0} : \quad \sigma_3 \sigma_1 = \frac{1 \mid 0}{0 \mid -1} \frac{0 \mid 1}{1 \mid 0} = \frac{0 \mid 1}{-1 \mid 0}$$

$$\sigma_2 \sigma_3 = \frac{0 \mid -i}{i \mid 0} \frac{1 \mid 0}{0 \mid -1} = \frac{0 \mid i}{i \mid 0} : \quad \sigma_3 \sigma_2 = \frac{1 \mid 0}{0 \mid -1} \frac{0 \mid -i}{i \mid 0} = \frac{0 \mid -i}{-i \mid 0}$$

$$\sigma_k \sigma_\ell + \sigma_\ell \sigma_k = 2\delta_{k\ell}$$

$$\sigma_1 \sigma_2 \sigma_3 = i1$$

$$\frac{0 \mid 1}{1 \mid 0} \frac{0 \mid -i}{i \mid 0} \frac{1 \mid 0}{0 \mid -1} = \frac{i \mid 0}{0 \mid -i} \frac{1 \mid 0}{0 \mid -1} = \frac{i \mid 0}{0 \mid i}$$