$$\mathbb{H} = \mathbb{C} + j\mathbb{C}$$

$$x + jy \in \mathbb{H} \rightharpoonup {}_2\mathbb{C}^2 \ni \begin{array}{c|c} x & y \\ \hline -y^* & x^* \end{array}$$

$$\underbrace{x + jy}\,\underbrace{u + jv} = \begin{array}{c|c} x & y \\ \hline -y^* & x^* \end{array} \begin{array}{c|c} u & v \\ \hline -v^* & u^* \end{array} = \underbrace{xu - yv^*} + j\,\underbrace{xv + yu^*}$$