

$$\left\{ \begin{array}{l} {}_{2:2}^n \mathbb{R}_n^\Omega \\ {}_{2:2}^n \mathbb{C}_n^\Omega \end{array} \right. = \left\{ \begin{array}{l} \mathbb{J} \in {}_{2:2}^n \mathbb{R}_n^{\mathbb{C}} \\ \mathbb{J} \in {}_{2:2}^n \mathbb{C}_n^{\mathbb{C}} \end{array} \right. \left\{ \begin{array}{l} \mathbb{J} = \begin{array}{c|c|c} \frac{0}{-1} & \frac{1}{0} & 0 \\ \hline 0 & \frac{0}{1} & \frac{-1}{0} \\ \hline 0 & \frac{0}{-1} & 0 \end{array} \\ \mathbb{J} = \begin{array}{c|c|c} \frac{0}{-1} & \frac{1}{0} & 0 \\ \hline 0 & \frac{0}{-1} & 0 \\ \hline 0 & \frac{0}{1} & \frac{-1}{0} \end{array} \end{array} \right.$$

$${}_{2:2}^n \mathbb{R}_n^\Omega = {}_4 \mathbb{R}_n^{\mathbb{C}} \cap {}_{2:2}^n \mathbb{C}_n^\Omega \xrightarrow{\begin{array}{c|c|c} \frac{\mathfrak{t}}{0} & \frac{0}{\mathfrak{t}} & 0 \\ \hline 0 & \frac{\mathfrak{t}}{0} & \frac{0}{\mathfrak{t}} \end{array}} {}_{2:2}^n \mathbb{C}_n^\Omega$$

$${}_{2\mathbb{R}}^n \mathbb{C}^\Omega = {}_{2\mathbb{R}}^n \mathbb{C}^{\mathbb{C}} \cap {}_{2:2}^n \mathbb{R}^\Omega \xrightarrow{\begin{array}{c|c} 0 & \begin{array}{c|c} 1 & 0 \\ 0 & 1 \end{array} \\ \hline \begin{array}{c|c} -1 & 0 \\ 0 & 1 \end{array} & 0 \end{array}} {}_{2:2}^n \mathbb{R}^\Omega$$

$$\mathbb{J} = \frac{A \mid B}{C \mid D} \Rightarrow \mathbb{J}_{\mathbb{R}} = \frac{\begin{array}{c|c} a & b \\ c & d \end{array} \mid \begin{array}{c|c} \alpha & \beta \\ \gamma & \delta \end{array}}{\begin{array}{c|c} -\alpha & \beta \\ \gamma & \delta \end{array} \mid \begin{array}{c|c} a & b \\ c & d \end{array}} \Rightarrow \left\{ \begin{array}{l} \mathbb{J}_{\mathbb{R}} \frac{\begin{array}{c|c} 1 & 0 \\ 0 & 1 \end{array} \mid 0}{0 \mid \begin{array}{c|c} 1 & 0 \\ 0 & 1 \end{array}} = \frac{\begin{array}{c|c} 1 & 0 \\ 0 & 1 \end{array} \mid 0}{0 \mid \begin{array}{c|c} 1 & 0 \\ 0 & 1 \end{array}} \mathbb{J}_{\mathbb{R}} \\ \mathbb{J}_{\mathbb{R}} \frac{0 \mid 1}{-1 \mid 0} = \frac{0 \mid 1}{-1 \mid 0} \mathbb{J}_{\mathbb{R}} \end{array} \right.$$

$$\mathbb{J} \frac{0 \mid 1}{-1 \mid 0} \mathbb{J}^t = \frac{0 \mid 1}{-1 \mid 0} \Rightarrow \mathbb{J}_{\mathbb{R}} \frac{\begin{array}{c|c} 0 & 1 \\ -1 & 0 \end{array} \mid 0}{0 \mid \begin{array}{c|c} 0 & -1 \\ 1 & 0 \end{array}} \mathbb{J}_{\mathbb{R}}^t = \mathbb{J}_{\mathbb{R}} \frac{0 \mid 1}{-1 \mid 0} \frac{\begin{array}{c|c} 1 & 0 \\ 0 & 1 \end{array} \mid 0}{0 \mid \begin{array}{c|c} -1 & 0 \\ 0 & 1 \end{array}} \mathbb{J}_{\mathbb{R}}^t$$

$$= \mathbb{J}_{\mathbb{R}} \frac{0 \mid 1}{-1 \mid 0} \mathbb{J}_{\mathbb{R}}^t \frac{\begin{array}{c|c} 1 & 0 \\ 0 & 1 \end{array} \mid 0}{0 \mid \begin{array}{c|c} -1 & 0 \\ 0 & 1 \end{array}} = \frac{0 \mid 1}{-1 \mid 0} \frac{\begin{array}{c|c} 1 & 0 \\ 0 & 1 \end{array} \mid 0}{0 \mid \begin{array}{c|c} -1 & 0 \\ 0 & 1 \end{array}} = \frac{0 \mid 1}{-1 \mid 0} \frac{0 \mid 1}{1 \mid 0}$$

$${}_{2\mathbb{B}}^n \xrightarrow{\begin{array}{c|c} 0 & 1 \\ 1 & 0 \end{array}} {}_{2\mathbb{B}}^n \times {}_{2\mathbb{B}}^n \xrightarrow{\begin{array}{c|c} 1 & 0 \\ 0 & -1 \end{array}} {}_{2:2}^n \mathbb{B}^\Omega$$

$${}_{2:2}^n \mathbb{B}^\Omega \xrightarrow{\begin{array}{c|c} 0 & 1 \\ 1 & 0 \end{array}} {}_{2:2}^n \mathbb{B}^\Omega \times {}_{2:2}^n \mathbb{B}^\Omega$$

$${}_{2\mathbb{B}}^{m+n} = \frac{\mathbb{J} \in {}_{2\mathbb{B}}^{m+n} \mathbb{C}}{\mathbb{J}_{\mathbb{R}} \frac{\begin{array}{c|c} 0 & 1 \\ -1 & 0 \end{array} \mid 0}{0 \mid \begin{array}{c|c} 0 & 1 \\ -1 & 0 \end{array}} \mathbb{J}_{\mathbb{R}}^t = \frac{\begin{array}{c|c} 0 & 1 \\ -1 & 0 \end{array} \mid 0}{0 \mid \begin{array}{c|c} 0 & 1 \\ -1 & 0 \end{array}}}$$