$$\hat{S}\left({}^{k}\mathbb{C}_{k}\right) = {}^{k}\mathbb{C}_{k}^{\mho}$$

$$S_{k}\left({}^{k+m}\mathbb{C}_{k+n}\right) = \frac{{}^{k+m}\mathbb{C}_{k+m}^{\mho} \times {}^{k+n}\mathbb{C}_{k+n}^{\mho}}{{}^{m}\mathbb{C}_{m}^{\mho} \times {}^{k}\mathbb{C}_{k}^{\mho} \times {}^{n}\mathbb{C}_{n}^{\mho}}$$

$$Gr_{k}\left(\mathbb{C}_{k+m}\right) \times Gr_{k}\left(\mathbb{C}_{k+n}\right) = \frac{{}^{k+m}\mathbb{C}_{k+m}^{\mho}}{{}^{k}\mathbb{C}_{k}^{\mho} \times {}^{m}\mathbb{C}_{m}^{\mho}} \times \frac{{}^{k+n}\mathbb{C}_{k+n}^{\mho}}{{}^{k}\mathbb{C}_{k}^{\mho} \times {}^{n}\mathbb{C}_{n}^{\mho}}$$

$$\begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} = \begin{array}{c|c} a & b \\ \hline c & d \end{array} \begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} \begin{array}{c|c} \alpha & \beta \\ \hline \gamma & \delta \end{array} = \begin{array}{c|c} a & 0 \\ \hline c & 0 \end{array} \begin{array}{c|c} \alpha & \beta \\ \hline \gamma & \delta \end{array} = \begin{array}{c|c} a\alpha & a\beta \\ \hline c\alpha & c\beta \end{array}$$

$$\Longrightarrow a\alpha = 1 : \beta = 0 = c$$

$$\begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} = \begin{array}{c|c} a & b \\ \hline c & d \end{array}^{-1} \begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} \begin{array}{c|c} \alpha & \beta \\ \hline \gamma & \delta \end{array}^{-1} = \begin{array}{c|c} \overset{*}{a} & \overset{*}{c} \\ \hline \overset{*}{b} & \overset{*}{d} \end{array} \begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} \begin{array}{c|c} \overset{*}{\alpha} & \overset{*}{\gamma} \\ \hline \overset{*}{\beta} & \overset{*}{\delta} \end{array} = \begin{array}{c|c} \overset{*}{a} & 0 \\ \hline \overset{*}{b} & 0 \end{array} \begin{array}{c|c} \overset{*}{\alpha} & \overset{*}{\gamma} \\ \hline \overset{*}{\beta} & \overset{*}{\delta} \end{array} = \begin{array}{c|c} \overset{*}{a}\overset{*}{\alpha} & \overset{*}{a}\overset{*}{\gamma} \\ \hline \overset{*}{b}\overset{*}{\alpha} & \overset{*}{b}\overset{*}{\gamma} \end{array}$$

$$\Longrightarrow \overset{*}{a}\,\overset{*}{\alpha} = 1 : \gamma = 0 = b$$

$$\Longrightarrow \begin{array}{c|c} a & b \\ \hline c & d \end{array} \begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} \begin{array}{c|c} \alpha & \beta \\ \hline \gamma & \delta \end{array} = \begin{array}{c|c} a & b \\ \hline c & d \end{array} \begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} \begin{array}{c|c} \alpha & \beta \\ \hline \gamma & \delta \end{array} \in {}^{m}\mathbb{C}_{m}^{\mho} \times {}^{k}\mathbb{C}_{k}^{\mho} \times {}^{n}\mathbb{C}_{n}^{\mho}$$

$$\hat{S}\left({}^{k}\mathbb{C}_{k}^{\oplus}\right) = \frac{{}^{k}\mathbb{C}_{k}^{\mho}}{{}^{k}\mathbb{R}_{k}^{\mho}}$$

$$S_{k}\left({}^{k+n}\mathbb{C}_{k+n}^{\oplus}\right) = \frac{{}^{k+n}\mathbb{C}_{k+n}^{\mho}}{{}^{k}\mathbb{R}_{k}^{\mho} \times {}^{n}\mathbb{C}_{n}^{\mho}}$$

$$Gr_{k}\left(\mathbb{C}_{k+n}\right) = \frac{{}^{k+n}\mathbb{C}_{k+n}^{\mho}}{{}^{k}\mathbb{C}_{k}^{\mho} \times {}^{n}\mathbb{C}_{n}^{\mho}}$$

$$\begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} = \begin{array}{c|c} a & b \\ \hline c & d \end{array} \begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} \begin{array}{c|c} a^{\sharp} & c^{\sharp} \\ \hline b^{\sharp} & d^{\sharp} \end{array} = \begin{array}{c|c} a & 0 \\ \hline c & 0 \end{array} \begin{array}{c|c} a^{\sharp} & c^{\sharp} \\ \hline b^{\sharp} & d^{\sharp} \end{array} = \begin{array}{c|c} aa^{\sharp} & ac^{\sharp} \\ \hline ca^{\sharp} & cc^{\sharp} \end{array}$$

$$\Longrightarrow a\,a^{\sharp} = 1 : c = 0 \Longrightarrow \bar{a} = a \Longrightarrow \begin{array}{c|c} a & b \\ \hline c & d \end{array} = \begin{array}{c|c} a & b \\ \hline c & d \end{array} \in {}^{k}\mathbb{R}_{k}^{\mho} \times {}^{n}\mathbb{C}_{n}^{\mho}$$

$$\begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} = \begin{array}{c|c} a & b \\ \hline c & d \end{array}^{-1} \begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} \begin{array}{c|c} a^{\sharp} & c^{\sharp} \\ \hline b^{\sharp} & d^{\sharp} \end{array}^{-1} = \begin{array}{c|c} \overset{*}{a} & \overset{*}{c} \\ \hline \overset{*}{b} & \overset{*}{d} \end{array} \begin{array}{c|c} 1 & 0 \\ \hline 0 & 0 \end{array} \begin{array}{c|c} \bar{a} & \bar{b} \\ \hline \bar{c} & \bar{d} \end{array} = \begin{array}{c|c} \overset{*}{a} & 0 \\ \hline \overset{*}{b} & 0 \end{array} \begin{array}{c|c} \bar{a} & \bar{b} \\ \hline \bar{c} & \bar{d} \end{array} = \begin{array}{c|c} \overset{*}{a}\bar{a} & \overset{*}{a}\bar{b} \\ \hline \overset{*}{b}\bar{a} & \overset{*}{b}\bar{b} \end{array}$$

$$\Longrightarrow \overset{*}{a}\,\bar{a} = 1 : b = 0$$

$$\Longrightarrow \begin{array}{c|c} a & b \\ \hline c & d \end{array} = \begin{array}{c|c} a & b \\ \hline c & d \end{array} \in {}^{k}\mathbb{R}_{k}^{\mho} \times {}^{n}\mathbb{C}_{n}^{\mho}$$