

$${}^n\mathbb{C}_n^{\mathcal{O}} \ni \begin{array}{c|c} a & b \\ \hline -\overset{*}{a} & d \end{array} \quad \begin{cases} a = -\overset{*}{a} \\ d = \overset{*}{d} \end{cases}$$

$${}^n\mathbb{H}_{\mathbb{C}^n}^{\mathcal{O}} \ni \begin{array}{c|c} a & b \\ \hline -\overset{*}{b} & \overset{*}{a} \end{array} \quad \begin{cases} a = -\overset{*}{a} \\ b = \overset{*}{b} \end{cases}$$

$$\frac{\bar{a}}{-\overset{*}{b}} \left| \begin{array}{c} \bar{b} \\ \bar{d} \end{array} \right. = J \frac{a}{-b} \left| \begin{array}{c} b \\ d \end{array} \right. J^{-1} = \frac{d}{-b} \left| \begin{array}{c} \overset{*}{b} \\ a \end{array} \right. \Leftrightarrow \begin{cases} d = \bar{a} \\ b = \overset{*}{b} \end{cases}$$

$${}^n\mathbb{R}_n^U \ni \begin{array}{c|c} a & b \\ \hline -\overset{*}{b} & d \end{array} \quad \begin{cases} a = -\overset{*}{a} \\ d = \overset{*}{d} \end{cases}$$

$$\frac{\bar{a}}{-\overset{*}{b}} \left| \begin{array}{c} \bar{b} \\ \bar{d} \end{array} \right. = \frac{a}{-b} \left| \begin{array}{c} b \\ d \end{array} \right. \Leftrightarrow \begin{cases} a = \bar{a} \\ b = \bar{b} \\ d = \bar{d} \end{cases}$$

$$\begin{array}{c} {}^n\mathbb{C}_{\mathbb{R}^n}^{\text{U}} \ni \frac{a \mid b}{-b \mid a} \quad \left\{ \begin{array}{l} a = \bar{a} = -\dot{a} \\ b = \bar{b} = \dot{b} \end{array} \right. \end{array}$$

$$\frac{a \mid b}{-\bar{b} \mid \bar{a}} = \mathcal{J} \frac{a \mid b}{-\bar{b} \mid \bar{a}} \stackrel{-1}{\mathcal{J}} = \frac{\bar{a} \mid \bar{b}}{-b \mid a} \Leftrightarrow \left\{ \begin{array}{l} a = \bar{a} \\ b = \bar{b} \end{array} \right.$$

$$\frac{a \mid b}{-\dot{b} \mid d} = \mathcal{J} \frac{a \mid b}{-\dot{b} \mid d} \stackrel{-1}{\mathcal{J}} = \frac{d \mid \dot{b}}{-b \mid a} \Leftrightarrow \left\{ \begin{array}{l} a = d \\ b = \dot{b} \end{array} \right.$$

$$\overbrace{\mathcal{J} - z}^{-1} \underbrace{\mathcal{J} + z}_{} \in {}_2^n\mathbb{C}_n^{\mathfrak{P}} \Leftrightarrow z \mathcal{J} \in {}_2^n\mathbb{C}_n^{\mathfrak{A}}$$

$$g = \overbrace{\mathcal{J} - z}^{-1} \underbrace{\mathcal{J} + z}_{} \in {}_2^n\mathbb{C}_n^{\mathfrak{P}}$$

$$\overbrace{\mathcal{J} + z}^{-1} \underbrace{\mathcal{J} - z}_{} = \overbrace{-g}^1 = \dot{g} = \underbrace{-\mathcal{J} + \dot{z}}_{-\mathcal{J} - \dot{z}} \overbrace{\mathcal{J} - \dot{z}}^{-1} = \underbrace{\mathcal{J} - \dot{z}}_{\mathcal{J} + \dot{z}} \overbrace{\mathcal{J} + \dot{z}}^{-1}$$

$$\Leftrightarrow \mathcal{J} \mathcal{J} - z \mathcal{J} + \mathcal{J} \dot{z} - z \dot{z} = \underbrace{\mathcal{J} - z}_{\mathcal{J} + z} \underbrace{\mathcal{J} + \dot{z}}_{\mathcal{J} - \dot{z}} = \underbrace{\mathcal{J} + z}_{\mathcal{J} - \dot{z}} \underbrace{\mathcal{J} - \dot{z}}_{\mathcal{J} + \dot{z}} = \mathcal{J} \mathcal{J} + z \mathcal{J} - \mathcal{J} \dot{z} - z \dot{z} \Leftrightarrow z \mathcal{J} = \mathcal{J} \dot{z} = - \overbrace{z \mathcal{J}}^{+}$$

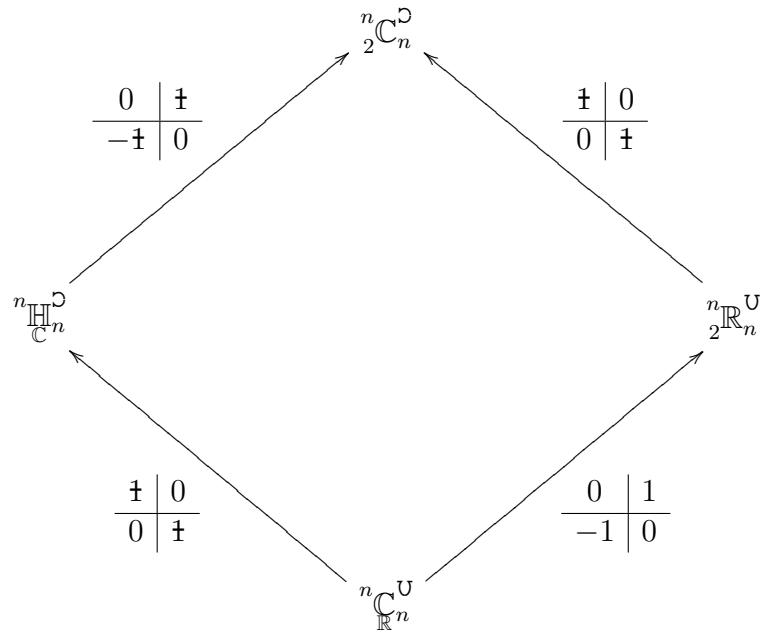
$$\overbrace{\mathcal{J} - z}^{-1} \underbrace{\mathcal{J} + z}_{} \in {}_2^n\mathbb{R}_n^{\text{U}} \Leftrightarrow z \in {}_2^n\mathbb{R}_n^{\mathfrak{A}} \mathcal{J}$$

$$zJ = -Jz \Leftrightarrow z = \frac{a \mid b}{b \mid -a} \quad \left\{ \begin{array}{l} a = -\dot{a} \\ b = -\dot{b} \end{array} \right.$$

$$\begin{array}{ccc} {}^n\mathbb{C}_n^{\emptyset} & \xrightarrow{\hspace{2cm}} & {}^n\mathbb{R}_n^U \\ & & \frac{{}^n\mathbb{C}_n^U}{{}^n\mathbb{C}_n} \end{array}$$

$$z \in {}^n\mathbb{C}_n^{\emptyset} \xrightarrow{\hspace{2cm}} {}^n\mathbb{C}_n^{\Omega} \ni \underbrace{\mathcal{J}^{-1} - z}_{\mathcal{J} + z}$$

$$\begin{array}{ccc} {}^n\mathbb{C}_n^{\emptyset} & \xrightarrow{\hspace{2cm}} & {}^n\mathbb{H}_n^{\complement} \\ & & \frac{{}^n\mathbb{C}_n^U}{{}^n\mathbb{C}_n} \\ \\ & \begin{array}{c} \nearrow \quad \searrow \\ \begin{array}{c|c} 0 & \pm \\ \hline -\pm & 0 \end{array} \end{array} & \begin{array}{c} \nearrow \quad \searrow \\ \begin{array}{c|c} \pm & 0 \\ \hline 0 & \pm \end{array} \end{array} \\ \\ & \begin{array}{c} \nearrow \quad \searrow \\ \mathcal{J} \end{array} & \begin{array}{c} \nearrow \quad \searrow \\ \mathcal{J} \end{array} \\ \\ & {}^n\mathbb{H}_n^{\complement} & {}^n\mathbb{R}_n^U \\ & \swarrow & \searrow \\ & {}^n\mathbb{C}_n^U & \end{array}$$



$$q \in n\mathbb{R}_n^U$$

$$1 = q^\vartheta q = \underbrace{\begin{matrix} 0 & | & -\frac{1}{2} \\ \frac{1}{2} & | & 0 \end{matrix}}_2 q \begin{matrix} 0 & | & \frac{1}{2} \\ -\frac{1}{2} & | & 0 \end{matrix} q$$

