

$$\begin{aligned}
0 &= 0 \bowtie \frac{\bar{\mathbb{J}}}{-\bar{\mathbb{J}}} \Big| \frac{\mathbb{J}}{\mathbb{J}} = \bar{\mathbb{J}}^{-1} \mathbb{J} \stackrel{\text{i}}{\Leftrightarrow} \mathbb{J} = 0 \\
0 &= 0 \bowtie \frac{1}{-1} \Big| \frac{1}{1} = 1 = 1 \bowtie \frac{\mathbb{J}^{*-1}}{0} \Big| \frac{0}{\mathbb{J}} = \mathbb{J}^* \mathbb{J} \stackrel{\text{iii}}{\Leftrightarrow} \mathbb{J}^{-1} = \mathbb{J}^* \\
0 &= 0 \bowtie \frac{1}{-1} \Big| \frac{1}{1} = 1 = 1 \bowtie \frac{\mathbb{J}}{0} \Big| \frac{0}{\mathbb{J}} = \mathbb{J}^{-1} \mathbb{J} \stackrel{\text{iv}}{\Leftrightarrow} \mathbb{J} = \mathbb{J} \\
0 &\bowtie \frac{1}{-i} \Big| \frac{-i}{1} = -i = -i \bowtie \frac{\mathbb{J}}{0} \Big| \frac{0}{\mathbb{J}} = -i \mathbb{J}^{-1} \mathbb{J} \stackrel{\text{v}}{\Leftrightarrow} \mathbb{J} = \mathbb{J} \\
0 &\bowtie \frac{-j}{ij} \Big| \frac{-i}{1} = ij = ij \frac{\mathbb{J}}{\mathbb{J}} \Big| \frac{\mathbb{J}}{\mathbb{J}} = \overbrace{\mathbb{J} + ij \mathbb{J}}^{-1} \underbrace{\mathbb{J} + ij \mathbb{J}}_{\text{vi}} \Leftrightarrow \begin{cases} \mathbb{J} = \bar{\mathbb{J}} \\ \mathbb{J} = -\bar{\mathbb{J}} \end{cases}
\end{aligned}$$

$${}^n\mathbb{R}_n^{\mathbb{U}} \sqsubset \mathbb{U} \Big|_{\dot{\mathbb{U}}} {}^n\mathbb{R}_n^{\mathfrak{D}} \xrightarrow{\varepsilon_0} {}^n\mathbb{R}_n^{\mathfrak{D}}$$

$${}^n\mathbb{R}_n^{\mathfrak{U}} \sqsubset \mathfrak{U} \Big|_{\dot{\mathbb{U}}} {}^n\mathbb{R}_n^{\mathfrak{D}} \xrightarrow{\varepsilon_0} {}^n\mathbb{R}_n^{\mathfrak{D}}$$

$$\mathfrak{U} \Big|_{\dot{\mathbb{U}}} {}^n\mathbb{R}_n^{\mathfrak{D}} = \mathfrak{U}_1 \Big|_{\dot{\mathbb{U}}} {}^n\mathbb{R}_n^{\mathfrak{D}} \times \mathfrak{U}_- \Big|_{\dot{\mathbb{U}}} {}^n\mathbb{R}_n^{\mathfrak{D}}$$

$$\mathfrak{U}_1 \Big|_{\dot{\mathbb{U}}} {}^n\mathbb{R}_n^{\mathfrak{D}} =$$

$$\mathfrak{U}_- \Big|_{\dot{\mathbb{U}}} {}^n\mathbb{R}_n^{\mathfrak{D}} =$$

$${}^n\mathbb{R}_n^{\mathbb{U}} : \times {}^n\mathbb{R}_n^{\mathbb{U}} \times {}^n\mathbb{R}_n^{\mathbb{U}} \xrightarrow[\succ]{\varepsilon_0} {}^n\mathbb{R}_n^{\mathfrak{D}}$$

$${}^n\mathbb{R}_n^{\mathbb{U}} : \times {}^n\mathbb{C}_n^{\mathfrak{D}} \xrightarrow[\succ]{\varepsilon_0} {}^n\mathbb{R}_n^{\mathfrak{D}}$$

$$0 \Big| {}^n\mathbb{R}_n^{\mathbb{U}} \times {}^n\mathbb{R}_n^{\mathbb{U}} \stackrel{\text{iv}}{=} {}^n\mathbb{R}_n^{\mathbb{U}} \stackrel{\text{i}}{=} 0 \Big| {}^n\mathbb{C}_n^{\mathfrak{D}}$$

$${}^n\mathbb{R}_n^{\mathcal{U}} \sqsubset \mathcal{U} \mid \dot{\mathcal{U}} \, {}^n\mathbb{R}_n^{\mathfrak{D}} \xrightarrow{\varepsilon_0} {}^n\mathbb{R}_n^{\mathfrak{D}}$$

$${}^n\mathbb{R}_n^{\mathcal{U}} \sqsubset \mathcal{U} \mid \dot{\mathcal{U}} \, {}^n\mathbb{R}_n^{\mathfrak{D}} \xrightarrow{\varepsilon_0} {}^n\mathbb{R}_n^{\mathfrak{D}}$$

$$\mathcal{U} \mid \dot{\mathcal{U}} \, {}^n\mathbb{R}_n^{\mathfrak{D}} = \mathcal{U}_1 \mid \dot{\mathcal{U}} \, {}^n\mathbb{R}_n^{\mathfrak{D}} \times \mathcal{U}_- \mid \dot{\mathcal{U}} \, {}^n\mathbb{R}_n^{\mathfrak{D}}$$

$$\mathcal{U}_1 \mid \dot{\mathcal{U}} \, {}^n\mathbb{R}_n^{\mathfrak{D}} =$$

$$\mathcal{U}_- \mid \dot{\mathcal{U}} \, {}^n\mathbb{R}_n^{\mathfrak{D}} =$$

$${}^n\mathbb{R}_n^{\mathcal{U}} \colon \times \, {}^n\mathbb{C}_n^{\mathcal{U}} \xrightarrow[\varprojlim]{\varepsilon_0} {}^n\mathbb{R}_n^{\mathfrak{D}}$$

$${}^n\mathbb{R}_n^{\mathcal{U}} \colon \times \, {}^n\mathbb{C}_n^{\mathbb{R}} \xrightarrow[\varprojlim]{\varepsilon_0} {}^n\mathbb{R}_n^{\mathfrak{D}}$$

$$\begin{array}{c} 0 \\ \diagdown \end{array} {}^n\mathbb{C}_n^{\mathcal{U}} \stackrel{=}{=} {}^n\mathbb{R}_n^{\mathcal{U}} \stackrel{=}{=} \begin{array}{c} 0 \\ \diagdown \end{array} {}^n\mathbb{C}_n^{\mathbb{R}}$$

$${}^n\mathbb{C}_n^{\mathbb{U}}\sqsubset\mathbb{U}|_{\dot{\mathbb{U}}}{}^n\mathbb{C}_n^{\mathfrak{U}}\xrightarrow{\varepsilon_0}{}^n\mathbb{C}_n^{\mathfrak{U}}$$

$${}^n\mathbb{C}_n^{\mathfrak{U}}\sqsubset\mathfrak{U}|_{\dot{\mathbb{U}}}{}^n\mathbb{C}_n^{\mathfrak{U}}\xrightarrow{\varepsilon_0}{}^n\mathbb{C}_n^{\mathfrak{U}}$$

$$\mathfrak{U}|_{\dot{\mathbb{U}}}{}^n\mathbb{C}_n^{\mathfrak{U}}=\mathfrak{U}_1|_{\dot{\mathbb{U}}}{}^n\mathbb{C}_n^{\mathfrak{U}}\times\mathfrak{U}_-|_{\dot{\mathbb{U}}}{}^n\mathbb{C}_n^{\mathfrak{U}}$$

$$\mathfrak{U}_1|_{\dot{\mathbb{U}}}{}^n\mathbb{C}_n^{\mathfrak{U}}=$$

$$\mathfrak{U}_-|_{\dot{\mathbb{U}}}{}^n\mathbb{C}_n^{\mathfrak{U}}=$$

$${}^n\mathbb{C}_n^{\mathbb{U}}\colon\!\!\times\,{}^n\mathbb{C}_n^{\mathbb{U}}\times{}^n\mathbb{C}_n^{\mathbb{U}}\xrightarrow[\succ]{\varepsilon_0}{}^n\mathbb{C}_n^{\mathfrak{U}}_{\circ}$$

$${}^n\mathbb{C}_n^{\mathbb{U}}\colon\!\!\times\,{}^n\mathbb{C}_n^{\mathfrak{U}}\xrightarrow[\asymp]{\varepsilon_0}{}^n\mathbb{C}_n^{\mathfrak{U}}_{\mathbb{U}}$$

$${}^0\!\!\downarrow\,{}^n\mathbb{C}_n^{\mathbb{U}}\times{}^n\mathbb{C}_n^{\mathbb{U}}\stackrel{\equiv}{\underset{\text{v}}{=}}{}^n\mathbb{C}_n^{\mathbb{U}}\stackrel{\equiv}{\underset{\text{iii}}{=}}{}^0\!\!\downarrow\,{}^n\mathbb{C}_n^{\mathfrak{U}}_{\mathfrak{c}}$$

$${}^n\mathbb{H}_n^{\mathcal{U}} \sqsubset \mathcal{U} \big|_{{\dot{\mathcal{U}}}} {}^n\mathbb{H}_n^{\mathcal{V}} \xrightarrow{\varepsilon_0} {}^n\mathbb{H}_n^{\mathcal{W}}$$

$${}^n\mathbb{H}_n^{\mathcal{V}} \sqsubset \mathcal{V} \big|_{{\dot{\mathcal{V}}}} {}^n\mathbb{H}_n^{\mathcal{W}} \xrightarrow{\varepsilon_0} {}^n\mathbb{H}_n^{\mathcal{W}}$$

$$\mathcal{V} \big|_{{\dot{\mathcal{V}}}} {}^n\mathbb{H}_n^{\mathcal{W}} = \mathcal{V}_1 \big|_{{\dot{\mathcal{V}}}} {}^n\mathbb{H}_n^{\mathcal{W}} \times \mathcal{V}_- \big|_{{\dot{\mathcal{V}}}} {}^n\mathbb{H}_n^{\mathcal{W}}$$

$$\mathcal{V}_1 \big|_{{\dot{\mathcal{V}}}} {}^n\mathbb{H}_n^{\mathcal{W}} =$$

$$\mathcal{V}_- \big|_{{\dot{\mathcal{V}}}} {}^n\mathbb{H}_n^{\mathcal{W}} =$$

$${}^n\mathbb{H}_n^{\mathcal{U}} : \times {}^n\mathbb{H}_n^{\mathcal{U}} \times {}^n\mathbb{H}_n^{\mathcal{U}} \xrightarrow[\succ]{\varepsilon_0} \bigcirc {}^n\mathbb{H}_n^{\mathcal{W}}$$

$${}^n\mathbb{H}_n^{\mathcal{U}} : \times {}^{2n}\mathbb{C}_{2n}^{\mathfrak{A}} \xrightarrow[\succ]{\varepsilon_0} {}^n\mathbb{H}_n^{\mathcal{W}}$$

$$\begin{array}{c} 0 \\ \diagdown \end{array} {}^n\mathbb{H}_n^{\mathcal{U}} \times {}^n\mathbb{H}_n^{\mathcal{U}} \stackrel{\text{iv}}{=} {}^n\mathbb{H}_n^{\mathcal{U}} \stackrel{\text{vi}}{=} \begin{array}{c} 0 \\ \diagdown \end{array} {}^{2n}\mathbb{C}_{2n}^{\mathfrak{A}}$$

$${}^n\mathbb{H}_n^{\mathcal{U}}\sqsubset \mathcal{U}|_{{}_{\dot{\mathcal{U}}}}{}^n\mathbb{H}_n^{\mathcal{V}}\xrightarrow{\varepsilon_0}{}^n\mathbb{H}_n^{\mathcal{V}}$$

$${}^n\mathbb{H}_n^{\mathcal{V}}\sqsubset \mathcal{V}|_{{}_{\dot{\mathcal{U}}}}{}^n\mathbb{H}_n^{\mathcal{V}}\xrightarrow{\varepsilon_0}{}^n\mathbb{H}_n^{\mathcal{V}}$$

$$\mathcal{V}|_{{}_{\dot{\mathcal{U}}}}{}^n\mathbb{H}_n^{\mathcal{V}}=\mathcal{V}_1|_{{}_{\dot{\mathcal{U}}}}{}^n\mathbb{H}_n^{\mathcal{V}}\times \mathcal{V}_-|_{{}_{\dot{\mathcal{U}}}}{}^n\mathbb{H}_n^{\mathcal{V}}$$

$$\mathcal{V}_1|_{{}_{\dot{\mathcal{U}}}}{}^n\mathbb{H}_n^{\mathcal{V}}=$$

$$\mathcal{V}_-|_{{}_{\dot{\mathcal{U}}}}{}^n\mathbb{H}_n^{\mathcal{V}}=$$

$${}^n\mathbb{H}_n^{\mathcal{U}}:\mathbf{\times}^{2n}\mathbb{C}_{2n}^{\mathcal{U}}\xrightarrow[\asymp]{\varepsilon_0}{}^n\mathbb{H}_n^{\mathcal{V}}\circ$$

$${}^n\mathbb{H}_n^{\mathcal{U}}:\mathbf{\times}_{{}_{\mathcal{C}}}{}^n\mathbb{H}_n\xrightarrow[\asymp]{\varepsilon_0}{}^n\mathbb{H}_n^{\mathcal{V}}|_{{}_{\mathcal{U}}}$$

$$\begin{array}{c} 0 \\ \diagdown \end{array} {}^{2n}\mathbb{C}_{2n}^{\mathcal{U}} \stackrel{\text{vi}}{=} {}^n\mathbb{H}_n^{\mathcal{U}} \stackrel{\text{iii}}{=} \begin{array}{c} 0 \\ \diagdown \end{array} {}^n\mathbb{H}_n|_{{}_{\mathcal{C}}}$$