

$$\diamond \subset \diamond \subset \begin{array}{c} \text{simple} \\ \blacklozenge \\ \text{frame} \end{array} \subset \frac{\mathbf{1} \in \mathbb{R} \underline{K}^{\mathbb{C}}}{\mathbb{1} \in \underline{K}^{\mathbb{C}} | \mathbf{1} = 0}$$

$$\diamond \underline{K}^{\mathbb{C}} = \frac{\mathbf{1} \in \underline{K}^{\mathbb{C}}}{\mathbf{1} | \diamond = 0} \subset \mathbb{R} \underline{K}^{\mathbb{C}} = \frac{\mathbf{1} \in \mathbb{R} \underline{K}^{\mathbb{C}}}{\mathbf{1} | \diamond = 0} = \underline{K}^{\mathbb{C}} \times \mathbb{1} \underline{K}^{\mathbb{C}}$$

$$\diamond \underline{K}^{\mathbb{I}} = \underline{K}^{\mathbb{C}} \times \underline{K}^{\mathbb{X}}$$

$$\diamond \underline{K}^{\mathbb{X}} = \frac{\mathbb{R} \underline{K}^{\mathbb{I}} \subset \underline{K}^{\mathbb{C}}}{\langle \diamond \rangle \ni \mathbf{1} \in \mathbb{R} \underline{K}^{\mathbb{I}}} = \underline{K}^{\mathbb{X}} \times \underline{K}^{\mathbb{X}}$$

$$\mathbb{1} \underline{K}^{\mathbb{I}} = \mathbb{1} \underline{K}^{\mathbb{C}} \times \mathbb{1} \underline{K}^{\mathbb{X}}$$

$$\mathbb{1} \underline{K}^{\mathbb{X}} = \frac{\mathbb{R} \underline{K}^{\mathbb{I}} \subset \mathbb{1} \underline{K}^{\mathbb{C}}}{\langle \diamond \rangle \ni \mathbf{1} \in \mathbb{R} \underline{K}^{\mathbb{I}}} = \mathbb{1} \underline{K}^{\mathbb{X}} \times \mathbb{1} \underline{K}^{\mathbb{X}}$$

$$\begin{cases} \mathbb{R} \underline{K}^{\mathbb{I}} \\ \mathbb{R} \underline{K}^{\mathbb{I}} \end{cases} = \mathbb{R} \underline{K}^{\mathbb{C}} \blacktriangleright \mathbb{R} \underline{K}^{\mathbb{C}} = \mathbb{R} \underline{K}^{\mathbb{I}} \times \left\{ \mathbb{1} \underline{K}^{\mathbb{C}} \right\} = \underline{K}^{\mathbb{I}} \times \left\{ \begin{array}{c} \mathbb{1} \underline{K}^{\mathbb{X}} \\ \mathbb{1} \underline{K}^{\mathbb{I}} \end{array} \right\}$$

$$= \left\{ \begin{array}{c} \underline{K}^{\mathbb{C}} \\ \mathbb{R} \underline{K}^{\mathbb{C}} \end{array} \right\} \times \overbrace{\underline{K}^{\mathbb{X}} \times \mathbb{1} \underline{K}^{\mathbb{X}}}^{\mathbb{R} \underline{K}^{\mathbb{X}}}$$

$$\mathbb{R} \underline{K}^{\mathbb{X}} = \frac{\mathbb{R} \underline{K}^{\mathbb{I}}}{\langle \diamond \rangle \ni \mathbf{1} \in \mathbb{R} \underline{K}^{\mathbb{I}}} = \overbrace{\underline{K}^{\mathbb{X}} \times \mathbb{1} \underline{K}^{\mathbb{X}}}^{\mathbb{R} \underline{K}^{\mathbb{X}}} \times \overbrace{\underline{K}^{\mathbb{X}} \times \mathbb{1} \underline{K}^{\mathbb{X}}}^{\mathbb{R} \underline{K}^{\mathbb{X}}}$$

$$\begin{aligned} \diamond \underline{K}^{\perp C} &= \diamond \underline{K}^{\perp C} \times \diamond \underline{K}^{\mathbb{M} C} = \overbrace{\diamond \underline{K}^{\perp C} \times \diamond \underline{K}^{\mathbb{K} C}}^{\diamond \underline{K}^{\mathbb{K} C}} \times \diamond \underline{K}^{\mathbb{M} C} \\ &= \diamond \underline{K}^{\mathbb{K} C} \times \overbrace{\diamond \underline{K}^{\mathbb{K} C} \times \diamond \underline{K}^{\mathbb{M} C}}^{\diamond \underline{K}^{\mathbb{M} C}} \end{aligned}$$

$$\diamond \underline{K}^{\mathbb{M} C} = \frac{\mathbb{R} \underline{K}^{\perp C} \sqsubset \underline{K}^{\mathbb{K} C}}{\langle \diamond \rangle \not\exists \mathbf{1} \in \diamond \underline{K}^{\perp C}: \mathbf{1} \in \underline{K}^{\mathbb{K} C} | \mathbf{1} = 0} = \diamond \underline{K}^{\mathbb{K} C} \times \diamond \underline{K}^{\mathbb{M} C}$$

$$\begin{aligned} \mathbf{1} \in \diamond \underline{K}^{\perp C} &= \mathbf{1} \in \diamond \underline{K}^{\perp C} \times \mathbf{1} \in \diamond \underline{K}^{\mathbb{M} C} \\ &= \mathbf{1} \in \diamond \underline{K}^{\mathbb{K} C} \times \overbrace{\mathbf{1} \in \diamond \underline{K}^{\mathbb{K} C} \times \mathbf{1} \in \diamond \underline{K}^{\mathbb{M} C}}^{\mathbf{1} \in \diamond \underline{K}^{\mathbb{M} C}} \end{aligned}$$

$$\mathbf{1} \in \diamond \underline{K}^{\mathbb{M} C} = \frac{\mathbb{R} \underline{K}^{\perp C} \sqsubset \mathbf{1} \in \underline{K}^{\mathbb{K} C}}{\langle \diamond \rangle \not\exists \mathbf{1} \in \diamond \underline{K}^{\perp C}: \mathbf{1} \in \underline{K}^{\mathbb{K} C} | \mathbf{1} = 0} = \mathbf{1} \in \diamond \underline{K}^{\mathbb{K} C} \times \mathbf{1} \in \diamond \underline{K}^{\mathbb{M} C}$$

$$\begin{aligned} \left\{ \begin{array}{l} \mathbb{R} \underline{K}^{\perp C} \\ \mathbb{R} \underline{K}^{\perp C} \\ \mathbb{R} \underline{K}^{\perp C} \end{array} \right\} &= \left\{ \begin{array}{l} \mathbb{R} \underline{K}^{\perp C} \\ \diamond \underline{K}^{\perp C} \times \mathbf{1} \in \underline{K}^{\mathbb{K} C} \\ \mathbb{R} \underline{K}^{\perp C} \end{array} \right\} \times \left\{ \begin{array}{l} \mathbb{R} \underline{K}^{\mathbb{M} C} \\ \diamond \underline{K}^{\mathbb{M} C} \times \mathbf{1} \in \underline{K}^{\mathbb{M} C} \end{array} \right\} = \left\{ \begin{array}{l} \overbrace{\diamond \underline{K}^{\perp C} \times \mathbf{1} \in \underline{K}^{\mathbb{K} C}}^{\diamond \underline{K}^{\mathbb{K} C}} \times \overbrace{\mathbf{1} \in \underline{K}^{\mathbb{K} C} \times \mathbf{1} \in \underline{K}^{\mathbb{M} C}}^{\mathbf{1} \in \diamond \underline{K}^{\mathbb{M} C}} \\ \mathbb{R} \underline{K}^{\perp C} \times \mathbb{R} \underline{K}^{\mathbb{K} C} \times \mathbb{R} \underline{K}^{\mathbb{M} C} \\ \mathbb{R} \underline{K}^{\mathbb{K} C} \end{array} \right\} \\ &= \left\{ \begin{array}{l} \mathbb{R} \underline{K}^{\perp C} \\ \mathbb{R} \underline{K}^{\perp C} \end{array} \right\} \times \overbrace{\underbrace{\diamond \underline{K}^{\perp C} \times \mathbf{1} \in \underline{K}^{\mathbb{K} C}}_{\mathbb{R} \underline{K}^{\mathbb{K} C}} \times \underbrace{\mathbf{1} \in \underline{K}^{\mathbb{K} C} \times \mathbf{1} \in \underline{K}^{\mathbb{M} C}}_{\mathbb{R} \underline{K}^{\mathbb{M} C}}}_{\mathbb{R} \underline{K}^{\mathbb{M} C}} = \underbrace{\mathbb{R} \underline{K}^{\perp C} \times \mathbb{R} \underline{K}^{\mathbb{K} C}}_{\mathbb{R} \underline{K}^{\mathbb{K} C}} \times \underbrace{\mathbf{1} \in \underline{K}^{\mathbb{K} C} \times \mathbf{1} \in \underline{K}^{\mathbb{M} C}}_{\mathbf{1} \in \diamond \underline{K}^{\mathbb{M} C}} \end{aligned}$$

$$\mathbb{R} \underline{K}^{\mathbb{M} C} = \frac{\mathbb{R} \underline{K}^{\perp C}}{\langle \diamond \rangle \not\exists \mathbf{1} \in \diamond \underline{K}^{\perp C}: \mathbf{1} \in \underline{K}^{\mathbb{K} C} | \mathbf{1} = 0} = \mathbb{R} \underline{K}^{\mathbb{K} C} \times \mathbf{1} \in \diamond \underline{K}^{\mathbb{M} C}$$

$$\begin{aligned}
\underline{\mathbb{R}}^{\perp C} &= \underline{\mathbb{R}}^{\perp C} \times \underline{\mathbb{R}}^{\times C} \\
&= \underline{\mathbb{R}}^{\perp C} \times \underline{\mathbb{R}}^{\times C} \times \underline{\mathbb{R}}^{\times C} \\
&= \underline{\mathbb{R}}^{\perp C} \times \underline{\mathbb{R}}^{\times C} \times \underline{\mathbb{R}}^{\times C} \times \underline{\mathbb{R}}^{\times C}
\end{aligned}$$

$$\underline{\mathbb{R}}^{\times C} = \frac{\underline{\mathbb{R}}^{\perp C}}{\mathbf{1} \in \underline{\mathbb{R}}^{\perp C}: \underline{\mathbb{R}}^{\perp C} | \mathbf{1} \neq 0: \underline{\mathbb{R}}^{\perp C} | \mathbf{1} = 0} = \underline{\mathbb{R}}^{\times C} \times \underline{\mathbb{R}}^{\times C}$$

$$\begin{aligned}
\underline{\mathbb{R}}^{\times C} &= \underline{\mathbb{R}}^{\perp C} \times \underline{\mathbb{R}}^{\times C} \\
&= \underline{\mathbb{R}}^{\perp C} \times \overbrace{\underline{\mathbb{R}}^{\times C} \times \underline{\mathbb{R}}^{\times C}}^{\underline{\mathbb{R}}^{\times C}}
\end{aligned}$$

$$\underline{\mathbb{R}}^{\times C} = \frac{\underline{\mathbb{R}}^{\perp C}}{\mathbf{1} \in \underline{\mathbb{R}}^{\perp C}: \underline{\mathbb{R}}^{\perp C} | \mathbf{1} \neq 0} = \underline{\mathbb{R}}^{\times C} \times \underline{\mathbb{R}}^{\times C}$$

$$\begin{aligned}
\underline{\mathbb{R}}_K^C &= \underline{\mathbb{R}}_K^{\perp C} \times \overbrace{\underline{\mathbb{R}}_K^{\mathbb{M}C} \times \underline{\mathbb{R}}_K^{\mathbb{X}C} \times \underline{\mathbb{R}}_K^{\mathbb{M}C}}^{\underline{\mathbb{R}}_K^{\mathbb{M}C}} = \overbrace{\underline{\mathbb{R}}_K^{\perp C} \times \underline{\mathbb{R}}_K^{\mathbb{M}C}}^{\underline{\mathbb{R}}_K^{\mathbb{M}C}} \times \underline{\mathbb{R}}_K^{\mathbb{X}C} \\
&= \underline{\mathbb{R}}_K^{\mathbb{X}C} \times \overbrace{\underline{\mathbb{R}}_K^{\mathbb{X}C} \times \underline{\mathbb{R}}_K^{\mathbb{M}C}}^{\underline{\mathbb{R}}_K^{\mathbb{M}C}} \times \overbrace{\underline{\mathbb{R}}_K^{\mathbb{X}C} \times \underline{\mathbb{R}}_K^{\mathbb{M}C}}^{\underline{\mathbb{R}}_K^{\mathbb{M}C}} = \underline{\mathbb{R}}_K^{\mathbb{X}C} \times \overbrace{\underline{\mathbb{R}}_K^{\mathbb{M}C} \times \underline{\mathbb{R}}_K^{\mathbb{X}C} \times \underline{\mathbb{R}}_K^{\mathbb{M}C}}^{\underline{\mathbb{R}}_K^{\mathbb{M}C}}
\end{aligned}$$

$$\underline{\mathbb{R}}_K^{\mathbb{M}C} = \frac{\underline{\mathbb{R}}_K^{\perp C}}{\langle \diamond \rangle \neq \mathbf{1} \in \underline{\mathbb{R}}_K^{\perp C}} = \underline{\mathbb{R}}_K^{\mathbb{X}C} \times \underline{\mathbb{R}}_K^{\mathbb{X}C}$$

$$\begin{array}{ccc}
\underline{\mathbb{R}}_K^{\mathbb{M}C} \cap \underline{\mathbb{R}}_K^{\perp C} \supset \underline{\mathbb{R}}_K^{\perp C} & \xrightarrow{\quad} & \underline{\mathbb{R}}_K^{\perp C} \cap \underline{\mathbb{R}}_K^{\mathbb{M}C} \\
\downarrow & & \downarrow \\
\underline{\mathbb{R}}_K^{\mathbb{M}C} \cap \underline{\mathbb{R}}_K^{\perp C} \supset \underline{\mathbb{R}}_K^{\mathbb{M}C} \cap \underline{\mathbb{R}}_K^{\perp C} & \xrightarrow{\quad} & \overbrace{\underline{\mathbb{R}}_K^{\mathbb{M}C} \cap \underline{\mathbb{R}}_K^{\perp C}}^{\underline{\mathbb{R}}_K^{\mathbb{M}C}} \cap \underline{\mathbb{R}}_K^{\perp C} \\
& & \searrow \quad \swarrow \\
& & \underline{\mathbb{R}}_K^{\perp C} \cap \underline{\mathbb{R}}_K^{\mathbb{M}C} \cap \underline{\mathbb{R}}_K^{\perp C}
\end{array}$$

$$\overbrace{\underline{\mathbb{R}}_K^{\mathbb{M}C} \cap \underline{\mathbb{R}}_K^{\perp C}}^{\underline{\mathbb{R}}_K^{\mathbb{M}C}} \cap \underline{\mathbb{R}}_K^{\perp C} = \underline{\mathbb{R}}_K^{\mathbb{M}C}$$

$$\underline{\mathbb{R}}_K^{\mathbb{X}C} = \underline{\mathbb{R}}_K^{\mathbb{X}C} + \underline{\mathbb{R}}_K^{\mathbb{X}C}: \quad \underline{\mathbb{R}}_K^{\mathbb{X}C} = \underline{\mathbb{R}}_K^{\mathbb{X}C} \times \underline{\mathbb{R}}_K^{\mathbb{X}C} \times \underline{\mathbb{R}}_K^{\mathbb{X}C} = \underline{\mathbb{R}}_K^{\mathbb{X}C} \times \underline{\mathbb{R}}_K^{\mathbb{X}C}$$



$$\mathbb{R}_{\diamond \underline{K}}^{\overline{C}} = \mathbb{R}_{\underline{K}}^{\overline{C}} \blacktriangleright_{\diamond \underline{K}^{\overline{C}}} : \mathbb{R}_{\diamond \underline{K}}^{\overline{C}} = \mathbb{R}_{\underline{K}_1}^{\overline{C}} \blacktriangleright_{\diamond \underline{K}^{\overline{C}}}$$

$$\mathbb{R}_{\diamond \underline{K}}^{\overline{C}} = \mathbb{R}_{\underline{K}}^{\overline{C}} \blacktriangleright_{\diamond \underline{K}^{\overline{C}}} : \mathbb{R}_{\diamond \underline{K}}^{\overline{C}} = \mathbb{R}_{\underline{K}_1}^{\overline{C}} \blacktriangleright_{\diamond \underline{K}^{\overline{C}}}$$

$$\mathbb{R}_{\diamond \underline{K}}^{\overline{C}} = \mathbb{R}_{\underline{K}_1}^{\overline{C}} \blacktriangleright_{\diamond \underline{K}^{\overline{C}}} : \mathbb{R}_{\diamond \underline{K}}^{\overline{C}} = \mathbb{R}_{\underline{K}_1}^{\overline{C}} \blacktriangleright_{\diamond \underline{K}^{\overline{C}}}$$

$$\mathbb{R}_{\diamond \underline{K}}^{\overline{C}} = \mathbb{R}_{\diamond \underline{K}}^{\overline{C}} \times \mathbb{R}_{\diamond \underline{K}}^{\overline{C}} \text{ bolic } \mathbb{C} : \mathbb{R}_{\diamond \underline{K}}^{\overline{C}} = \frac{\mathbb{R}_{\diamond \underline{K}_1}^{\overline{C}}}{\langle \square \rangle \not\equiv 1 \in \overline{\mathbb{H}}_1}$$