$$\mathcal{P}|\daleth \overset{c}{\underset{0}{\bigtriangledown}}\mathbb{R} \ni \iota_\lambda P_\lambda$$

$$\downarrow$$

$$\mho|\daleth \ni \int^{dP_\lambda} \mathbb{R}\iota_\lambda = \int_{dP}^{\mathbb{R}} \iota$$

$$\iota \in \mathbb{R}\bigtriangledown_{\alpha|\beta}$$

$$\mathcal{A} \text{ part von } \alpha|\beta$$

$$\mathcal{A} \ni A = \ell_A | r_A$$

$$|A| = r_A - \ell_A$$

$$|\mathcal{A}| = \max_{A \in \mathcal{A}} |A| = \max_{A \in \mathcal{A}} \underbrace{r_A - \ell_A}$$

$$P_A := P_{r_A} - P_{\ell_A} \in \mathcal{P}|\daleth \text{ proj-valued length}$$

$$\underline{\Sigma}_{\mathcal{A}}\iota = \sum_{\mathcal{A} \ni A} \overset{A}{\curlywedge} \iota P_A \in \mho|\daleth \ni \bar{\Sigma}_{\mathcal{A}}\iota = \sum_{\mathcal{A} \ni A} \overset{A}{\curlyvee} \iota P_A$$

$$\underline{\Sigma}_{\mathcal{A}}\iota \leqslant \bar{\Sigma}_{\mathcal{A}}\iota \text{ in } \mho|\daleth$$

$$P_\lambda \text{ isoton } \Rightarrow P_A = P_{r_A} - P_{\ell_A} \geqslant 0 \Rightarrow \bar{\Sigma}_{\mathcal{A}}\iota - \underline{\Sigma}_{\mathcal{A}}\iota = \sum_{\mathcal{A} \ni A} \underbrace{\overset{A}{\curlyvee}\iota - \overset{A}{\curlywedge}\iota}_{\geqslant 0} P_A \geqslant 0$$

$$\overbrace{\bar{\Sigma}_{\mathcal{A}}\iota - \underline{\Sigma}_{\mathcal{A}}\iota} \leqslant \max \mathcal{A} \ni A \underbrace{\overset{A}{\curlyvee}\iota - \overset{A}{\curlywedge}\iota} = |\mathcal{A}|_\iota$$

$$0 \leqslant \bar{\Sigma}_{\mathcal{A}}\iota - \underline{\Sigma}_{\mathcal{A}}\iota = \sum_{\mathcal{A} \ni A} \underbrace{\overset{A}{\curlyvee}\iota - \overset{A}{\curlywedge}\iota} P_A \leqslant |\mathcal{A}|_\iota \sum_{\mathcal{A} \ni A} P_A = |\mathcal{A}|_\iota \overset{\text{proj}}{P}_{\alpha|\beta}$$

$$\underset{\text{Prop}}{\Longrightarrow} \overbrace{\bar{\Sigma}_{\mathcal{A}}\iota - \underline{\Sigma}_{\mathcal{A}}\iota} \leqslant |\mathcal{A}|_\iota \overbrace{P_{\alpha|\beta}}^{\leqslant 1} \leqslant |\mathcal{A}|_\iota$$

$$\mathcal{A} \prec \mathcal{B} \Leftrightarrow \bigwedge_{B \in \mathcal{B}} \bigvee_{A \in \mathcal{A}} B \subset I \Leftrightarrow \mathcal{B} = \bigcup_{A \in \mathcal{A}} \frac{B \in \mathcal{B}}{B \subset I}$$

$$\alpha|\beta = \bigcup_{A \in \mathcal{A}} A = \bigcup_{B \in \mathcal{B}} B = \bigcup_{A \in \mathcal{A}} \bigcup_{\mathcal{B} \ni B \subset I} B$$

$$A = \bigcup_{\mathcal{B} \ni B \subset I} B \Rightarrow P_A = \sum_{\mathcal{B} \ni B \subset I} P_B$$

$$\mathcal{A} \prec \mathcal{B} \Rightarrow \underline{\Sigma}_{\mathcal{A}} \iota \leqslant \underline{\Sigma}_{\mathcal{B}} \iota \leqslant \bar{\Sigma}_{\mathcal{B}} \iota \leqslant \bar{\Sigma}_{\mathcal{A}} \iota$$

$$\bar{\Sigma}_{\mathcal{B}} \iota = \sum_{\mathcal{B} \ni B} \overset{B}{\Upsilon} \iota \, P_B = \sum_{\mathcal{A} \ni A} \sum_{\mathcal{B} \ni B \subset I} \overset{B}{\Upsilon} \iota \, P_B \leqslant \sum_{\mathcal{A} \ni A} \overset{A}{\Upsilon} \iota \sum_{\mathcal{B} \ni B \subset I} P_B = \sum_{\mathcal{A} \ni A} \overset{A}{\Upsilon} P_A = \bar{\Sigma}_{\mathcal{A}} \iota$$

$$\bigvee_{\text{stop-limits}} \overset{\infty}{\mathfrak{U}} | \daleth \ni \int_{*} \iota := \overset{s}{\lim_{\mathcal{A}}} \underline{\Sigma}_{\mathcal{A}} \iota \leqslant \overset{s}{\lim_{\mathcal{A}}} \bar{\Sigma}_{\mathcal{A}} \iota = \int^{*} \iota \in \overset{\infty}{\mathfrak{U}} | \daleth$$

$$\iota \in \mathbb{R} \triangledown_{0\,\alpha|\beta} \Rightarrow \int_{*} \iota = \int^{*} \iota = \int_{dP_\lambda}^{\alpha|\beta} \iota_\lambda$$

$$\iota \text{ u-stet } \Rightarrow \bigwedge_{\varepsilon > 0} \bigvee_{\mathcal{A}} \bigwedge_{\mathcal{B} \prec \mathcal{A}} |\mathcal{B}|_{\iota} \leqslant \varepsilon$$

$$\Rightarrow 0 \leqslant \int^{*} \iota - \int_{*} \iota \leqslant \bar{\Sigma}_{\mathcal{B}} \iota - \underline{\Sigma}_{\mathcal{B}} \underset{\text{pos}}{\Rightarrow} \left\lceil \int^{*} \iota - \int_{*} \iota \right\rceil \leqslant \left\lceil \bar{\Sigma}_{\mathcal{B}} \iota - \underline{\Sigma}_{\mathcal{B}} \iota \right\rceil \leqslant |\mathcal{B}|_{\iota} \leqslant \varepsilon$$