$$\daleth \in \overset{\nu}{\underset{0}{\triangleleft}} \mathbb{K} \text{ poly-normed}$$

$$\daleth \text{ metr } \Leftrightarrow \bigvee_{\text{basis}}^{\text{abz}} p_0 \leqslant p_1 \leqslant \cdots \text{ treu stet HalbNorm}$$

$$\Rightarrow : \quad \daleth \text{ metr } \Rightarrow \bigvee_{\text{abz}} \text{ 0-UmgBasis } \left(\daleth^{0}_{\leqslant 1/n}\right)_n^{\mathbb{N}} \Rightarrow \wedge \text{ lic } - \text{ con } \bigvee_{\text{Tonne}} V_n \subset \daleth^{0}_{\leqslant 1/n}$$

$$\Rightarrow \text{ 0-UmgBasis Tonne } \overset{n}{\underset{\leqslant}{\daleth}} = \bigcap_{m \leqslant n} V_m \supset \overset{n+1}{\underset{\leqslant}{\daleth}}$$

$$\Rightarrow \text{ stet Halbnorm-Basis } p_{\overset{n}{\underset{\leqslant}{\daleth}}} \leqslant p_{\overset{n+1}{\underset{\leqslant}{\daleth}}}$$

$$\daleth \text{ treu } \Rightarrow \bigcap_n^{\mathbb{N}} \ker p_{\overset{n}{\underset{\leqslant}{\daleth}}} = (0)$$

$$\Leftarrow : \quad \sum_{0 \leqslant n} \overset{>0}{a}_n < +\infty$$

$$\delta(\daleth) = \sum_{0 \leqslant n} a_n \frac{{}^{n}\daleth}{{}^{n}\daleth + 1} \in \mathbb{R}_+$$

$$\urcorner \wr \bar{7} = \delta(\urcorner - \bar{7}) \text{ metric on } \underline{\urcorner}$$

$$\urcorner \wr \bar{7} = \bar{7} \wr \urcorner$$

$$\urcorner \wr \bar{7} = 0 \Rightarrow \bigwedge_{0 \leqslant n} \sqrt[n]{\urcorner - \bar{7}} = 0 \Rightarrow \urcorner - \bar{7} \in \bigcap_{0 \leqslant n} \ker p_n \underset{\text{treu}}{=} (0) \Rightarrow \urcorner = \bar{7}$$

$$\urcorner \wr \acute{\urcorner} = \underbrace{\urcorner + \bar{7}} \wr \underbrace{\acute{\urcorner} + \bar{7}} \text{ transl-inv}$$

$$\bigvee_{a:b:c}^{\geqslant 0} c \leqslant a + b \Rightarrow \frac{c}{c+1} \leqslant \frac{a}{a+1} + \frac{b}{b+1}$$

$$\frac{1}{a+b} \leqslant \frac{1}{c} \text{ auch } c = 0 \underset{+}{\Rightarrow} \frac{1}{a+b} \leqslant 1 + \frac{1}{c} \Rightarrow \frac{c}{c+1} = \frac{1}{1+1/c} \leqslant \frac{1}{\dfrac{1}{a+b} + 1} = \frac{a+b}{a+b+1}$$

$$= \frac{a}{a+b+1} + \frac{b}{a+b+1} \leqslant \frac{a}{a+1} + \frac{b}{b+1}$$

$$\sqrt[n]{\urcorner - \bar{\bar{7}}} \leqslant \sqrt[n]{\urcorner - \bar{7}} + \sqrt[n]{\bar{7} - \bar{\bar{7}}} \Rightarrow \frac{\sqrt[n]{\urcorner - \bar{\bar{7}}}}{\sqrt[n]{\urcorner - \bar{\bar{7}}} + 1} \leqslant \frac{\sqrt[n]{\urcorner - \bar{7}}}{\sqrt[n]{\urcorner - \bar{7}} + 1} + \frac{\sqrt[n]{\bar{7} - \bar{\bar{7}}}}{\sqrt[n]{\bar{7} - \bar{\bar{7}}} + 1} \Rightarrow \urcorner \wr \bar{\bar{7}} \leqslant \mathsf{L} \wr \mathsf{Ł} + \bar{7} \wr \bar{\bar{7}}$$

$$\bigwedge_{r}^{>0} \bigvee_{m}^{\mathbb{N}} \underline{\overset{m}{\urcorner}}_{\leqslant r/2 \sum a_n} \subset \underline{\urcorner}_{\leqslant r}$$

$$\bigvee_{m}^{\mathbb{N}} \sum_{m \leqslant n} a_n < r/2 \Rightarrow \sum_{m \leqslant n} a_n \frac{\sqrt[n]{\urcorner}}{\sqrt[n]{\urcorner} + 1} \leqslant \sum_{m \leqslant n} a_n \sqrt[n]{\urcorner} \leqslant \sqrt[m]{\urcorner} \sum_{m \leqslant n} a_n \leqslant \sqrt[m]{\urcorner} \sum_{0 \leqslant n} a_n$$

$$\delta \urcorner = \sum_{n \in m} a_n \frac{\sqrt[n]{\urcorner}}{\sqrt[n]{\urcorner} + 1} + \sum_{m \leqslant n} a_n \frac{\sqrt[n]{\urcorner}}{\sqrt[n]{\urcorner} + 1} \leqslant \sqrt[m]{\urcorner} \sum_{0 \leqslant n} a_n + \sum_{m \leqslant n} a_n \leqslant \frac{\sqrt[n]{\urcorner} \sum_{0 \leqslant n} a_n}{2} (r/2) + r/2 = r$$

$$\bigvee_{\varepsilon}^{>0} \beth_{\leqslant \varepsilon a_m/2} \subset \overset{m}{\beth}_{\leqslant \varepsilon}$$

$$\urcorner \wr 0 \leqslant \varepsilon\, a_m/2 \Rightarrow a_m \frac{{}^{m}\overline{\urcorner}}{{}^{m}\overline{\urcorner} + 1} \leqslant \urcorner \wr 0 \leqslant \varepsilon\, a_m/2 \underset{a_m > 0}{\Rightarrow}$$

$${}^{m}\overline{\urcorner} \leqslant \varepsilon \underbrace{{}^{m}\overline{\urcorner} + 1}/2 = \varepsilon/2 + \varepsilon\, {}^{m}\overline{\urcorner}/2 \leqslant \varepsilon/2 + {}^{m}\overline{\urcorner}/2 \Rightarrow {}^{m}\overline{\urcorner}/2 \leqslant \varepsilon/2 \Rightarrow {}^{m}\overline{\urcorner} \leqslant \varepsilon$$

$$\mathcal{T}_d = \mathcal{T}$$

$$U \in \mathcal{U} \Rightarrow \bigvee_{m}^{\mathbb{N}} \bigvee_{\varepsilon}^{>0} \overset{m}{\beth}_{\leqslant \varepsilon} \subset U$$

$$\text{stand 0-Umgbasis } \beth \supset \overset{0}{\beth}_{\leqslant 1/n} = \frac{\urcorner \in \beth}{\delta(\urcorner) < 1/n}$$

$$\beth \in \overset{\nu}{\underset{0}{\triangleleft}} \mathbb{K} \text{ poly-normed}$$

$$\beth \text{ Frech } \Leftrightarrow \text{ lic-conv voll metr}$$

$$\underline{\urcorner}:\wr \text{ fol-voll } \Rightarrow \underline{\urcorner}:\wr \text{ fil-voll}$$

$$\Leftarrow: \quad \mathcal{P}(\underline{\urcorner}) \supset \mathcal{M} \text{ CauFil } \Rightarrow \bigwedge_{U}^{\mathcal{U}} \bigvee_{M}^{\mathcal{M}} M - M \subset U$$

$$\left(\underline{\urcorner}^{0}_{\leqslant 1/n}\right)^{\mathbb{N}}_{n} \text{ abz 0-UmgBasis } \Rightarrow \bigwedge_{n}^{\mathbb{N}} \bigvee_{M_n}^{\mathcal{M}} M_n - M_n \subset \underline{\urcorner}^{0}_{\leqslant 1/n} \Rightarrow \mathcal{M} \ni \bigcap_{m \leqslant n} M_m \neq \varnothing \Rightarrow \bigvee \urcorner_n \in \bigcap_{m \leqslant n} M_m$$

$$\Rightarrow \bigwedge_{p:q}^{\geqslant n} \urcorner_p - \urcorner_q \in \bigcap_{m \leqslant p} M_m - \bigcap_{m \leqslant q} M_m \subset M_n - M_n \subset \underline{\urcorner}^{0}_{\leqslant 1/n} \Rightarrow \underline{\urcorner} \ni \urcorner_n \underset{\text{Cau}}{\rightsquigarrow} \underset{\text{Vor}}{\Rightarrow} \urcorner_n \rightsquigarrow \urcorner \in \underline{\urcorner}$$

$$\bigwedge_{U}^{\mathcal{U}} \bigvee_{V}^{\mathcal{U}} V + V \subset U \Rightarrow \bigvee_{k}^{\mathbb{N}} U_k \subset V \Rightarrow \bigvee_{m}^{\geqslant k} \bigwedge_{n}^{\geqslant m} \urcorner_n - \urcorner \in U_k$$

$$\urcorner_n \in \bigcap_{m \leqslant n} M_m \subset M_k \Rightarrow M_k - \urcorner_n \subset M_k - M_k \subset U_k$$

$$\Rightarrow \mathcal{M} \ni M_k \subset \urcorner_n + U_k \subset \urcorner + U_k + U_k \subset \urcorner + V + V \subset \urcorner + U$$

$$\underset{\text{Fil}}{\Rightarrow} \urcorner + U \in \mathcal{M} \Rightarrow \urcorner + \mathcal{U} = \frac{\urcorner + U}{U \in \mathcal{U}} \subset \mathcal{M} \Rightarrow \mathcal{M} \rightsquigarrow \urcorner$$