$K \in \left\{ \frac{(\Gamma_0 \otimes f) \cap \cdots \cap (\Gamma_n \otimes f)}{n \in \mathbb{N}} \right\}$. So

$$K \in \left\{ \frac{(\Gamma'_0 \otimes f) \cap \cdots \cap (\Gamma'_n \otimes f)}{n \in \mathbb{N}, \Gamma'_i \in \operatorname{up} \bigsqcup T} \right\} = \left\{ \frac{(\Gamma'_0 \cap \cdots \cap \Gamma'_n) \otimes f}{n \in \mathbb{N}, \Gamma'_i \in \operatorname{up} \bigsqcup T} \right\} = \operatorname{up} \bigsqcap^{\mathsf{RLD}(\operatorname{Src} f \times V, \mho)} \left\{ \frac{G \otimes f}{G \in \operatorname{up} \bigsqcup T} \right\}.$$

□

10.4. Proof of the main result

Let's prove a special case of conjecture 1055:

THEOREM 1160. $(\bigsqcup T) \circ F = \bigsqcup \left\{ \frac{G \circ F}{G \in T} \right\}$ for every principal reloid $F = \uparrow^{\mathsf{RLD}} f$ (for a **Rel**-morphism f) and a set T of reloids from $\operatorname{Dst} F$ to some set V. (In other words principal reloids are co-metacomplete and thus also metacomplete by duality.)

PROOF.

$$\left(\bigsqcup T\right) \circ F = \bigsqcap^{\mathsf{RLD}(\operatorname{Src} f, V)} \langle \operatorname{dom} \rangle^* \left(\left(\bigsqcup T \right) \otimes F \right) = \operatorname{dom} \bigsqcap^{\mathsf{RLD}(\operatorname{Src} f \times V, \mho)} \left(\left(\bigsqcup T \right) \otimes F \right) = \operatorname{dom} \bigsqcap^{\mathsf{RLD}(\operatorname{Src} f \times V, \mho)}_{G \in \operatorname{up} \bigsqcup T} (G \otimes f);$$

$$\bigsqcup_{G \in T} (G \circ F) = \bigsqcup_{G \in T} \bigsqcap^{\mathsf{RLD}(\operatorname{Src} f, V)} \langle \operatorname{dom} \rangle^* (G \otimes F) = \bigsqcup_{G \in T} \operatorname{dom} \bigsqcap^{\mathsf{RLD}(\operatorname{Src} f \times V, \mho)} (G \otimes F) = \operatorname{dom} \bigsqcup_{G \in T} \bigsqcap^{\mathsf{RLD}(\operatorname{Src} f \times V, \mho)} (G \otimes F).$$

It's enough to prove

$$\bigsqcap^{\mathsf{RLD}(\operatorname{Src} f \times V, \mho)}_{G \in \operatorname{up} \bigsqcup T} (G \otimes f) = \bigsqcup_{G \in T} \bigsqcap^{\mathsf{RLD}(\operatorname{Src} f \times V, \mho)} (G \otimes F)$$

but this is the statement of the lemma. □

10.5. Embedding reloids into funcoids

DEFINITION 1161. Let f be a reloid. The funcoid

$$\rho f = \mathsf{FCD}(\mathscr{P}(\operatorname{Src} f \times \operatorname{Src} f), \mathscr{P}(\operatorname{Dst} f \times \operatorname{Dst} f))$$