* theorem 40 in [15].

Thus $\operatorname{Compl} f$ is principal. □

Theorem 60 $\operatorname{Compl} \operatorname{CoCompl} f = \operatorname{CoCompl} \operatorname{Compl} f = \operatorname{Cor} f$ *for every reloid* f.

Proof We will prove only $\operatorname{Compl} \operatorname{CoCompl} f = \operatorname{Cor} f$. The rest follows from symmetry.

From the lemma $\operatorname{Compl} \operatorname{CoCompl} f$ is principal. It is obvious $\operatorname{Compl} \operatorname{CoCompl} f \subseteq f$. So to finish the proof we need to show only that for every principal reloid $F \subseteq f$ we have $F \subseteq \operatorname{Compl} \operatorname{CoCompl} f$.

Really, obviously $F \subseteq \operatorname{CoCompl} f$ and thus $F = \operatorname{Compl} F \subseteq \operatorname{Compl} \operatorname{CoCompl} f$. □

Question 28. Is $\operatorname{Compl} \mathsf{RLD}(A; B)$ a distributive lattice? Is $\operatorname{Compl} \mathsf{RLD}(A; B)$ a co-brouwerian lattice?

Conjecture 12 *Let A, B, C are small sets. If $f \in \mathsf{RLD}(B; C)$ is a complete reloid and $R \in \mathscr{P}\mathsf{RLD}(A; B)$ then*

$$f \circ \bigcup R = \bigcup \langle f \circ \rangle R.$$

This conjecture can be weakened:

Conjecture 13 *Let A, B, C are small sets. If $f \in \mathsf{RLD}(B; C)$ is a principal reloid and $R \in \mathscr{P}\mathsf{RLD}(A; B)$ then*

$$f \circ \bigcup R = \bigcup \langle f \circ \rangle R.$$

Conjecture 14 $\operatorname{Compl} f = f \setminus^* (\Omega^{\operatorname{Src} f} \times^{\mathsf{RLD}} 1^{\mathfrak{F}(\operatorname{Dst} f)})$ *for every reloid* f.

5 Relationships between funcoids and reloids

5.1 Funcoid induced by a reloid

Every reloid f induces a funcoid $(\mathsf{FCD})f \in \mathsf{FCD}(\operatorname{Src} f; \operatorname{Dst} f)$ by the following formulas (for every $\mathcal{X} \in \mathfrak{F}(\operatorname{Src} f)$, $\mathcal{Y} \in \mathfrak{F}(\operatorname{Dst} f)$):

$$\mathcal{X} \left[(\mathsf{FCD})f\right] \mathcal{Y} \Leftrightarrow \forall F \in \operatorname{up} f : \mathcal{X} \left[\uparrow^{\mathsf{FCD}(\operatorname{Src} f; \operatorname{Dst} f)} F\right] \mathcal{Y};$$
$$\langle (\mathsf{FCD})f \rangle \mathcal{X} = \bigcap \left\{ \left\langle \uparrow^{\mathsf{FCD}(\operatorname{Src} f; \operatorname{Dst} f)} F \right\rangle \mathcal{X} \quad | \quad F \in \operatorname{up} f \right\}.$$

We should prove that $(\mathsf{FCD})f$ is really a funcoid.

Proof We need to prove that

$$\mathcal{X} \left[(\mathsf{FCD})f\right] \mathcal{Y} \Leftrightarrow \mathcal{Y} \cap \langle (\mathsf{FCD})f \rangle \mathcal{X} \neq 0^{\mathfrak{F}(\operatorname{Dst} f)} \Leftrightarrow \mathcal{X} \cap \left\langle (\mathsf{FCD})f^{-1} \right\rangle \mathcal{Y} \neq 0^{\mathfrak{F}(\operatorname{Dst} f)}.$$