Definition (Loop operator $\dagger$). For a map $h : \mathbf{F}_1 \times \mathbf{F}_2 \to \mathcal{A}\mathbf{R}$, define

$$\begin{aligned} h^\dagger : \mathbf{F}_1 &\to \mathcal{A}\mathbf{R}, \\ f_1 &\mapsto \mathrm{lfp}\left(\Psi^h_{f_1}\right), \end{aligned}$$

where lfp is the least-fixed point operator, and $\Psi^h_{f_1}$ is defined as

$$\begin{aligned} \Psi^h_{f_1} : \mathcal{A}\mathbf{R} &\to \mathcal{A}\mathbf{R}, \\ R &\mapsto \operatorname*{Min}_{\preceq_{\mathbf{R}}} \bigcup_{r \in R} h(f_1, r) \cap \uparrow r. \end{aligned}$$