

w-causl^{11,40}

$$e <_c e' \equiv_{\text{def}} e \lambda e, e'. e <_{\text{loc}} e' \vee ((\uparrow \text{isrcv}(\text{kind}(e'))) \text{ c} \wedge (e = \text{sender}(e')))^+ e'$$

clarification:

$$\begin{aligned} & \text{w-causl}(w; e; e') \\ \equiv_{\text{def}} & e \\ & \text{rel_plus}(\text{w-E}(w); \\ & \quad (\lambda e, e'. \text{w-locl}(w; e; e') \\ & \quad \vee ((\uparrow \text{isrcv}(\text{w-ekind}(w; e'))) \text{ c} \wedge (e = \text{w-sender}(w; e') \in \text{w-E}(w)))) e' \end{aligned}$$