$x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$  $x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$  $: \left( \mathbf{Chan} \ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left( \alpha_{24} \xrightarrow{\beta_{26}} \left( \mathbf{Chan} \ \dot{\alpha}_{50} \times \alpha_{24} \right) \right) \right) \quad : \mathbf{Chan} \ \dot{\alpha}_{31}$  $\frac{\left\{\left(\left(\right) \xrightarrow{\beta_{28}} \mathbf{Chan} \ \alpha_{27}\right) \subseteq \left(\left(\right) \xrightarrow{\beta_{30}} \mathbf{Chan} \ \dot{\alpha}_{31}\right), \left\{\mathbf{CHAN} \ \alpha_{27}\right\} \subseteq \beta_{28}\right\}}{\left\{\left(\left(\right) \xrightarrow{\beta_{28}} \mathbf{Chan} \ \alpha_{27}\right) \subseteq \left(\left(\right) \xrightarrow{\beta_{30}} \mathbf{Chan} \ \dot{\alpha}_{31}\right), \left\{\mathbf{CHAN} \ \alpha_{27}\right\} \subseteq \beta_{28}\right\}}$  $\leadsto_{\mathcal{F}} \{\alpha_{27} \subseteq \dot{\alpha}_{31}, \dot{\alpha}_{31} \subseteq \alpha_{27}, \{\mathbf{CHAN} \ \alpha_{27}\} \subseteq \beta_{28}, \{\beta_{28}\} \subseteq \beta_{30}\}$  $\sim_{\mathcal{R}} \mathbf{Chan} \; \dot{\alpha}_{31} \& \; \{\{\mathbf{CHAN} \; \dot{\alpha}_{31}\} \subseteq \beta_{28}, \{\beta_{28}\} \subseteq \beta_{30}\}$  $f \mapsto \forall . \{\} \Rightarrow \left(\dot{\alpha}_{885} \xrightarrow{\dot{\beta}_{252}} \dot{\alpha}_{890}\right)$  $f \mapsto \forall . \{\} \Rightarrow \left(\dot{\alpha}_{885} \xrightarrow{\dot{\beta}_{252}} \dot{\alpha}_{890}\right)$  $\begin{cases} x \mapsto \forall . \{\} \Rightarrow \alpha_{10} \\ y \mapsto \forall . \{\} \Rightarrow \alpha_2 \end{cases}$  $x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$ -((,) (channel ())) $y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $\&\left\{\left(\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\alpha_{24} \xrightarrow{\beta_{26}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right)\right) \subseteq \left(\mathbf{Chan}\ \dot{\alpha}_{31} \xrightarrow{\beta_{37}} \left(\dot{\alpha}_{72} \xrightarrow{\dot{\beta}_{41}} \left(\mathbf{Chan}\ \dot{\alpha}_{51} \times \dot{\alpha}_{40}\right)\right)\right), \\ \left\{\mathbf{CHAN}\ \dot{\alpha}_{31}\right\} \subseteq \beta_{28}, \\ \left\{\beta_{28}\right\} \subseteq \beta_{30}\right\} \xrightarrow{\&\left\{\left\{\mathbf{Chan}\ \dot{\alpha}_{50} \times \dot{\alpha}_{24}\right\}\right\}} \\ \&\left\{\left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\alpha_{24} \xrightarrow{\beta_{26}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\alpha_{24} \xrightarrow{\beta_{26}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\alpha_{24} \xrightarrow{\beta_{26}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\alpha_{24} \xrightarrow{\beta_{26}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\}\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\} \\ = \left\{\mathbf{Chan}\ \dot{\alpha}_{50} \xrightarrow{\beta_{25}} \left(\mathbf{Chan}\ \dot{\alpha}_{50} \times \alpha_{24}\right)\right\}$  $\leadsto_{\mathcal{F}} \left\{ \alpha_{24} \subseteq \dot{\alpha}_{40}, \dot{\alpha}_{31} \subseteq \dot{\alpha}_{50}, \dot{\alpha}_{50} \subseteq \dot{\alpha}_{31}, \dot{\alpha}_{50} \subseteq \dot{\alpha}_{51}, \dot{\alpha}_{51} \subseteq \dot{\alpha}_{50}, \dot{\alpha}_{72} \subseteq \alpha_{24}, \left\{ \mathbf{CHAN} \ \dot{\alpha}_{31} \right\} \subseteq \beta_{28}, \left\{ \beta_{25} \right\} \subseteq \beta_{37}, \left\{ \beta_{26} \right\} \subseteq \dot{\beta}_{41}, \left\{ \beta_{28} \right\} \subseteq \beta_{30} \right\}$  $\rightsquigarrow_{\mathcal{R}} \left(\dot{\alpha}_{72} \xrightarrow{\dot{\beta}_{41}} (\mathbf{Chan} \ \dot{\alpha}_{51} \times \dot{\alpha}_{72})\right) \& \left\{ \{\mathbf{CHAN} \ \dot{\alpha}_{51}\} \subseteq \beta_{28}, \{\beta_{25}\} \subseteq \beta_{37}, \{\beta_{26}\} \subseteq \dot{\beta}_{41}, \{\beta_{28}\} \subseteq \beta_{30} \right\}$  $x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$  $x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$  $\lfloor y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $: \left( \left( \mathbf{Chan} \ \dot{\alpha}_{92} \times \dot{\alpha}_{92} \right) \xrightarrow{\beta_{21}} \dot{\alpha}_{92} \ \mathbf{Com} \ \beta_{22} \right)$  $\&\left\{\left(\dot{\alpha}_{72} \xrightarrow{\dot{\beta}_{41}} \left(\mathbf{Chan} \ \dot{\alpha}_{51} \times \dot{\alpha}_{72}\right)\right) \subseteq \left(\alpha_{2} \xrightarrow{\beta_{71}} \left(\mathbf{Chan} \ \dot{\alpha}_{803} \times \dot{\alpha}_{76}\right)\right), \left\{\mathbf{CHAN} \ \dot{\alpha}_{51}\right\} \subseteq \beta_{28}, \left\{\beta_{25}\right\} \subseteq \beta_{37}, \left\{\beta_{26}\right\} \subseteq \dot{\beta}_{41}, \left\{\beta_{28}\right\} \subseteq \beta_{30}\right\}$  $\left\{ \left( \dot{\alpha}_{72} \xrightarrow{\dot{\beta}_{41}} \left( \mathbf{Chan} \ \dot{\alpha}_{51} \times \dot{\alpha}_{72} \right) \right) \subseteq \left( \alpha_2 \xrightarrow{\beta_{71}} \left( \mathbf{Chan} \ \dot{\alpha}_{803} \times \dot{\alpha}_{76} \right) \right), \left\{ \mathbf{CHAN} \ \dot{\alpha}_{51} \right\} \subseteq \beta_{28}, \left\{ \beta_{25} \right\} \subseteq \beta_{37}, \left\{ \beta_{26} \right\} \subseteq \dot{\beta}_{41}, \left\{ \beta_{28} \right\} \subseteq \beta_{30} \right\}$  $\leadsto_{\mathcal{F}} \left\{ \alpha_2 \subseteq \dot{\alpha}_{72}, \dot{\alpha}_{51} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{72} \subseteq \dot{\alpha}_{76}, \dot{\alpha}_{803} \subseteq \dot{\alpha}_{51}, \left\{ \mathbf{CHAN} \ \dot{\alpha}_{51} \right\} \subseteq \beta_{28}, \left\{ \beta_{25} \right\} \subseteq \beta_{37}, \left\{ \beta_{26} \right\} \subseteq \dot{\beta}_{41}, \left\{ \beta_{28} \right\} \subseteq \beta_{30}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $\leadsto_{\mathcal{R}} \left(\mathbf{Chan} \ \dot{\alpha}_{803} \times \alpha_2\right) \& \left\{ \left\{\mathbf{CHAN} \ \dot{\alpha}_{803} \right\} \subseteq \beta_{28}, \left\{\beta_{25} \right\} \subseteq \beta_{37}, \left\{\beta_{26} \right\} \subseteq \dot{\beta}_{41}, \left\{\beta_{28} \right\} \subseteq \beta_{30}, \left\{\dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $f \mapsto \forall . \{\} \Rightarrow \left(\dot{\alpha}_{885} \xrightarrow{\dot{\beta}_{252}} \dot{\alpha}_{890}\right)$  $x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$  $x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$  $y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $\vdash (\mathbf{send} (((,) (\mathbf{channel} ())) y))$  $: \left(\dot{\alpha}_{131} \text{ Com } \beta_{19} \xrightarrow{\beta_{19}} \dot{\alpha}_{131}\right)$  $\&\left\{\left((\mathbf{Chan}\ \dot{\alpha}_{92}\times\dot{\alpha}_{92})\ \stackrel{\beta_{21}}{\longrightarrow}\dot{\alpha}_{92}\ \mathbf{Com}\ \beta_{22}\right)\subseteq\left((\mathbf{Chan}\ \dot{\alpha}_{803}\times\alpha_{2})\ \stackrel{\beta_{88}}{\longrightarrow}\dot{\alpha}_{103}\ \mathbf{Com}\ \dot{\beta}_{104}\right),\\ \left\{\mathbf{CHAN}\ \dot{\alpha}_{803}\right\}\subseteq\beta_{28},\\ \left\{\beta_{25}\right\}\subseteq\beta_{37},\\ \left\{\beta_{26}\right\}\subseteq\dot{\beta}_{41},\\ \left\{\beta_{28}\right\}\subseteq\beta_{30},\\ \left\{\dot{\beta}_{41}\right\}\subseteq\beta_{71}\right\}$  $\left\{\left(\left(\mathbf{Chan}\ \dot{\alpha}_{92}\times\dot{\alpha}_{92}\right)\xrightarrow{\beta_{21}}\dot{\alpha}_{92}\ \mathbf{Com}\ \beta_{22}\right)\subseteq\left(\left(\mathbf{Chan}\ \dot{\alpha}_{803}\times\alpha_{2}\right)\xrightarrow{\beta_{88}}\dot{\alpha}_{103}\ \mathbf{Com}\ \dot{\beta}_{104}\right),\left\{\mathbf{CHAN}\ \dot{\alpha}_{803}\right\}\subseteq\beta_{28},\left\{\beta_{25}\right\}\subseteq\beta_{37},\left\{\beta_{26}\right\}\subseteq\dot{\beta}_{41},\left\{\beta_{28}\right\}\subseteq\beta_{30},\left\{\dot{\beta}_{41}\right\}\subseteq\beta_{71}\right\}$  $\leadsto_{\mathcal{F}} \left\{ \alpha_2 \subseteq \dot{\alpha}_{92}, \dot{\alpha}_{803} \subseteq \dot{\alpha}_{92}, \dot{\alpha}_{92} \subseteq \dot{\alpha}_{103}, \dot{\alpha}_{92} \subseteq \dot{\alpha}_{803}, \left\{ \mathbf{CHAN} \ \dot{\alpha}_{803} \right\} \subseteq \beta_{28}, \left\{ \beta_{21} \right\} \subseteq \beta_{88}, \left\{ \beta_{22} \right\} \subseteq \dot{\beta}_{104}, \left\{ \beta_{25} \right\} \subseteq \beta_{37}, \left\{ \beta_{26} \right\} \subseteq \dot{\beta}_{41}, \left\{ \beta_{28} \right\} \subseteq \beta_{30}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $\leadsto_{\mathcal{R}} \dot{\alpha}_{803} \mathbf{Com} \ \dot{\beta}_{104} \& \left\{ \alpha_2 \subseteq \dot{\alpha}_{803}, \{ \mathbf{CHAN} \ \dot{\alpha}_{803} \} \subseteq \beta_{28}, \{ \beta_{21} \} \subseteq \beta_{88}, \{ \beta_{22} \} \subseteq \dot{\beta}_{104}, \{ \beta_{25} \} \subseteq \beta_{37}, \{ \beta_{26} \} \subseteq \dot{\beta}_{41}, \{ \beta_{28} \} \subseteq \beta_{30}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $f \mapsto \forall . \{\} \Rightarrow \left(\dot{\alpha}_{885} \xrightarrow{\dot{\beta}_{252}} \dot{\alpha}_{890}\right)$  $x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$  $x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$  $\lfloor y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $\vdash (\mathbf{sync} \ (\mathbf{send} \ (((,) \ (\mathbf{channel} \ ())) \ y)))$  $: \left(\dot{\alpha}_{150} \xrightarrow{\beta_{16}} \left(\alpha_{15} \xrightarrow{\beta_{17}} \left(\dot{\alpha}_{150} \times \alpha_{15}\right)\right)\right)$  $\left\{ \alpha_2 \subseteq \dot{\alpha}_{803}, \left( \dot{\alpha}_{131} \text{ Com } \beta_{19} \xrightarrow{\beta_{19}} \dot{\alpha}_{131} \right) \subseteq \left( \dot{\alpha}_{803} \text{ Com } \dot{\beta}_{104} \xrightarrow{\beta_{122}} \dot{\alpha}_{132} \right), \left\{ \text{CHAN } \dot{\alpha}_{803} \right\} \subseteq \beta_{28}, \left\{ \beta_{21} \right\} \subseteq \beta_{88}, \left\{ \beta_{22} \right\} \subseteq \dot{\beta}_{104}, \left\{ \beta_{25} \right\} \subseteq \dot{\beta}_{37}, \left\{ \beta_{26} \right\} \subseteq \dot{\beta}_{41}, \left\{ \beta_{28} \right\} \subseteq \beta_{30}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $\left\{\alpha_{2} \subseteq \dot{\alpha}_{803}, \left(\dot{\alpha}_{131} \text{ Com } \beta_{19} \xrightarrow{\beta_{19}} \dot{\alpha}_{131}\right) \subseteq \left(\dot{\alpha}_{803} \text{ Com } \dot{\beta}_{104} \xrightarrow{\beta_{122}} \dot{\alpha}_{132}\right), \left\{\text{CHAN } \dot{\alpha}_{803}\right\} \subseteq \beta_{28}, \left\{\beta_{21}\right\} \subseteq \beta_{88}, \left\{\beta_{22}\right\} \subseteq \dot{\beta}_{104}, \left\{\beta_{25}\right\} \subseteq \dot{\beta}_{37}, \left\{\beta_{26}\right\} \subseteq \dot{\beta}_{41}, \left\{\beta_{28}\right\} \subseteq \beta_{30}, \left\{\dot{\beta}_{41}\right\} \subseteq \beta_{71}\right\}$  $x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$  $y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$  $\vdash ((,) \ (\mathbf{sync} \ (\mathbf{send} \ (((,) \ (\mathbf{channel} \ ())) \ y))))$  $y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $\left\{ \alpha_2 \subseteq \dot{\alpha}_{803}, \left( \dot{\alpha}_{150} \xrightarrow{\beta_{16}} \left( \alpha_{15} \xrightarrow{\beta_{17}} (\dot{\alpha}_{150} \times \alpha_{15}) \right) \right) \subseteq \left( \dot{\alpha}_{803} \xrightarrow{\beta_{146}} \left( \dot{\alpha}_{181} \xrightarrow{\dot{\beta}_{160}} (\dot{\alpha}_{158} \times \dot{\alpha}_{159}) \right) \right), \\ \left\{ \mathbf{CHAN} \ \dot{\alpha}_{803} \right\} \subseteq \beta_{28}, \\ \left\{ \beta_{19} \right\} \subseteq \beta_{122}, \\ \left\{ \beta_{21} \right\} \subseteq \beta_{88}, \\ \left\{ \beta_{22} \right\} \subseteq \dot{\beta}_{104}, \\ \left\{ \beta_{25} \right\} \subseteq \dot{\beta}_{41}, \\ \left\{ \beta_{28} \right\} \subseteq \beta_{30}, \\ \left\{ \dot{\beta}_{104} \right\} \subseteq \beta_{19}, \\ \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $\left\{\alpha_{2}\subseteq\dot{\alpha}_{803},\left(\dot{\alpha}_{150}\xrightarrow{\beta_{16}}\left(\alpha_{15}\xrightarrow{\beta_{16}}\left(\dot{\alpha}_{150}\times\alpha_{15}\right)\right)\right)\subseteq\left(\dot{\alpha}_{803}\xrightarrow{\beta_{146}}\left(\dot{\alpha}_{181}\xrightarrow{\dot{\beta}_{160}}\left(\dot{\alpha}_{158}\times\dot{\alpha}_{159}\right)\right)\right),\left\{\mathbf{CHAN}\ \dot{\alpha}_{803}\right\}\subseteq\beta_{28},\left\{\beta_{19}\right\}\subseteq\beta_{122},\left\{\beta_{21}\right\}\subseteq\beta_{88},\left\{\beta_{22}\right\}\subseteq\dot{\beta}_{104},\left\{\beta_{25}\right\}\subseteq\dot{\beta}_{41},\left\{\beta_{28}\right\}\subseteq\beta_{30},\left\{\dot{\beta}_{104}\right\}\subseteq\beta_{19},\left\{\dot{\beta}_{41}\right\}\subseteq\beta_{71}\right\}$  $\rightarrow_{\mathcal{F}} \left\{ \alpha_{15} \subseteq \dot{\alpha}_{159}, \alpha_{2} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{150} \subseteq \dot{\alpha}_{158}, \dot{\alpha}_{181} \subseteq \alpha_{15}, \dot{\alpha}_{803} \subseteq \dot{\alpha}_{150}, \left\{ \mathbf{CHAN} \ \dot{\alpha}_{803} \right\} \subseteq \beta_{28}, \left\{ \beta_{16} \right\} \subseteq \beta_{146}, \left\{ \beta_{17} \right\} \subseteq \dot{\beta}_{160}, \left\{ \beta_{19} \right\} \subseteq \beta_{122}, \left\{ \beta_{21} \right\} \subseteq \beta_{88}, \left\{ \beta_{22} \right\} \subseteq \dot{\beta}_{104}, \left\{ \beta_{25} \right\} \subseteq \dot{\beta}_{41}, \left\{ \beta_{28} \right\} \subseteq \beta_{30}, \left\{ \dot{\beta}_{104} \right\} \subseteq \beta_{19}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $\overset{\leftarrow}{\mathcal{R}} \left( \dot{\alpha}_{181} \xrightarrow{\dot{\beta}_{160}} (\dot{\alpha}_{803} \times \dot{\alpha}_{181}) \right) & \left\{ \alpha_2 \subseteq \dot{\alpha}_{803}, \left\{ \mathbf{CHAN} \ \dot{\alpha}_{803} \right\} \subseteq \beta_{28}, \left\{ \beta_{16} \right\} \subseteq \beta_{146}, \left\{ \beta_{17} \right\} \subseteq \dot{\beta}_{160}, \left\{ \beta_{19} \right\} \subseteq \beta_{122}, \left\{ \beta_{21} \right\} \subseteq \beta_{88}, \left\{ \beta_{22} \right\} \subseteq \dot{\beta}_{104}, \left\{ \beta_{25} \right\} \subseteq \dot{\beta}_{41}, \left\{ \beta_{28} \right\} \subseteq \beta_{30}, \left\{ \dot{\beta}_{104} \right\} \subseteq \beta_{19}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $x \mapsto \forall . \{\} \Rightarrow \alpha_{10}$  $\begin{cases} x \mapsto \forall . \{\} \Rightarrow \alpha_{10} \\ y \mapsto \forall . \{\} \Rightarrow \alpha_2 \end{cases}$  $y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $\vdash (((,) \ (\mathbf{sync} \ (\mathbf{send} \ (((,) \ (\mathbf{channel} \ ()))) \ y)))) \ x)$  $: \left( \left( \dot{\alpha}_{222} \times \dot{\alpha}_{205} \right) \xrightarrow{\beta_{13}} \dot{\alpha}_{205} \right)$  $\left\{ \alpha_{2} \subseteq \dot{\alpha}_{803}, \left( \dot{\alpha}_{181} \xrightarrow{\dot{\beta}_{160}} (\dot{\alpha}_{803} \times \dot{\alpha}_{181}) \right) \subseteq \left( \alpha_{10} \xrightarrow{\beta_{180}} (\dot{\alpha}_{189} \times \dot{\alpha}_{190}) \right), \left\{ \mathbf{CHAN} \ \dot{\alpha}_{803} \right\} \subseteq \beta_{28}, \left\{ \beta_{16} \right\} \subseteq \beta_{146}, \left\{ \beta_{17} \right\} \subseteq \dot{\beta}_{160}, \left\{ \beta_{19} \right\} \subseteq \beta_{122}, \left\{ \beta_{21} \right\} \subseteq \beta_{88}, \left\{ \beta_{22} \right\} \subseteq \dot{\beta}_{104}, \left\{ \beta_{25} \right\} \subseteq \dot{\beta}_{37}, \left\{ \beta_{26} \right\} \subseteq \dot{\beta}_{41}, \left\{ \beta_{28} \right\} \subseteq \beta_{30}, \left\{ \dot{\beta}_{104} \right\} \subseteq \beta_{19}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $\left\{\alpha_{2} \subseteq \dot{\alpha}_{803}, \left(\dot{\alpha}_{181} \xrightarrow{\dot{\beta}_{160}} (\dot{\alpha}_{803} \times \dot{\alpha}_{181})\right) \subseteq \left(\alpha_{10} \xrightarrow{\beta_{180}} (\dot{\alpha}_{189} \times \dot{\alpha}_{190})\right), \left\{\mathbf{CHAN} \ \dot{\alpha}_{803}\right\} \subseteq \beta_{28}, \left\{\beta_{16}\right\} \subseteq \beta_{146}, \left\{\beta_{17}\right\} \subseteq \dot{\beta}_{160}, \left\{\beta_{19}\right\} \subseteq \beta_{122}, \left\{\beta_{21}\right\} \subseteq \beta_{88}, \left\{\beta_{22}\right\} \subseteq \dot{\beta}_{104}, \left\{\beta_{26}\right\} \subseteq \dot{\beta}_{41}, \left\{\beta_{28}\right\} \subseteq \beta_{30}, \left\{\dot{\beta}_{104}\right\} \subseteq \beta_{19}, \left\{\dot{\beta}_{41}\right\} \subseteq \beta_{71}\right\}$  $\Rightarrow_{\mathcal{F}} \left\{ \alpha_{10} \subseteq \dot{\alpha}_{181}, \alpha_{2} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{181} \subseteq \dot{\alpha}_{190}, \dot{\alpha}_{803} \subseteq \dot{\alpha}_{189}, \left\{ \mathbf{CHAN} \ \dot{\alpha}_{803} \right\} \subseteq \beta_{28}, \left\{ \beta_{16} \right\} \subseteq \beta_{160}, \left\{ \beta_{19} \right\} \subseteq \beta_{122}, \left\{ \beta_{21} \right\} \subseteq \beta_{88}, \left\{ \beta_{22} \right\} \subseteq \dot{\beta}_{104}, \left\{ \beta_{25} \right\} \subseteq \dot{\beta}_{17}, \left\{ \beta_{28} \right\} \subseteq \dot{\beta}_{19}, \left\{ \dot{\beta}_{104} \right\} \subseteq \beta_{180}, \left\{ \dot{\beta}_{19} \right\} \subseteq \beta_{180$  $\Rightarrow_{\mathcal{R}} (\dot{\alpha}_{803} \times \alpha_{10}) \& \left\{ \alpha_2 \subseteq \dot{\alpha}_{803}, \{ \mathbf{CHAN} \ \dot{\alpha}_{803} \} \subseteq \beta_{28}, \{ \beta_{16} \} \subseteq \beta_{146}, \{ \beta_{17} \} \subseteq \dot{\beta}_{160}, \{ \beta_{19} \} \subseteq \beta_{122}, \{ \beta_{21} \} \subseteq \beta_{88}, \{ \beta_{22} \} \subseteq \dot{\beta}_{104}, \{ \beta_{25} \} \subseteq \dot{\beta}_{41}, \{ \beta_{28} \} \subseteq \beta_{30}, \left\{ \dot{\beta}_{104} \right\} \subseteq \beta_{19}, \left\{ \dot{\beta}_{160} \right\} \subseteq \beta_{180}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $\vdash (\mathbf{snd} \ (((,) \ (\mathbf{sync} \ (\mathbf{send} \ (((,) \ (\mathbf{channel} \ ())) \ y)))) \ x))$  $\& \left\{ \alpha_2 \subseteq \dot{\alpha}_{803}, \left( (\dot{\alpha}_{222} \times \dot{\alpha}_{205}) \xrightarrow{\beta_{13}} \dot{\alpha}_{205} \right) \subseteq \left( (\dot{\alpha}_{803} \times \alpha_{10}) \xrightarrow{\beta_{204}} \dot{\alpha}_{213} \right), \left\{ \mathbf{CHAN} \ \dot{\alpha}_{803} \right\} \subseteq \beta_{146}, \left\{ \beta_{17} \right\} \subseteq \dot{\beta}_{160}, \left\{ \beta_{19} \right\} \subseteq \beta_{122}, \left\{ \beta_{21} \right\} \subseteq \beta_{37}, \left\{ \beta_{26} \right\} \subseteq \dot{\beta}_{41}, \left\{ \beta_{28} \right\} \subseteq \beta_{30}, \left\{ \dot{\beta}_{104} \right\} \subseteq \beta_{180}, \left\{ \dot{\beta}_{160} \right\} \subseteq \beta_{180}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $\left\{\alpha_{2}\subseteq\dot{\alpha}_{803},\left((\dot{\alpha}_{222}\times\dot{\alpha}_{205})\xrightarrow{\beta_{13}}\dot{\alpha}_{205}\right)\subseteq\left((\dot{\alpha}_{803}\times\alpha_{10})\xrightarrow{\beta_{204}}\dot{\alpha}_{213}\right),\left\{\mathbf{CHAN}\ \dot{\alpha}_{803}\right\}\subseteq\beta_{18},\left\{\beta_{16}\right\}\subseteq\beta_{160},\left\{\beta_{19}\right\}\subseteq\beta_{122},\left\{\beta_{21}\right\}\subseteq\beta_{88},\left\{\beta_{22}\right\}\subseteq\dot{\beta}_{104},\left\{\beta_{25}\right\}\subseteq\dot{\beta}_{41},\left\{\beta_{28}\right\}\subseteq\beta_{30},\left\{\dot{\beta}_{104}\right\}\subseteq\beta_{19},\left\{\dot{\beta}_{160}\right\}\subseteq\beta_{180},\left\{\dot{\beta}_{41}\right\}\subseteq\beta_{71}\right\}$  $\sim_{\mathcal{R}} \alpha_{10} \& \left\{ \alpha_2 \subseteq \dot{\alpha}_{803}, \{ \mathbf{CHAN} \ \dot{\alpha}_{803} \} \subseteq \beta_{28}, \{ \beta_{13} \} \subseteq \beta_{204}, \{ \beta_{16} \} \subseteq \beta_{146}, \{ \beta_{17} \} \subseteq \dot{\beta}_{160}, \{ \beta_{19} \} \subseteq \beta_{122}, \{ \beta_{21} \} \subseteq \beta_{88}, \{ \beta_{22} \} \subseteq \dot{\beta}_{104}, \{ \beta_{25} \} \subseteq \dot{\beta}_{41}, \{ \beta_{28} \} \subseteq \beta_{30}, \left\{ \dot{\beta}_{104} \right\} \subseteq \beta_{19}, \left\{ \dot{\beta}_{160} \right\} \subseteq \beta_{180}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{71} \right\}$  $f \mapsto \forall . \{\} \Rightarrow \left(\dot{\alpha}_{885} \xrightarrow{\dot{\beta}_{252}} \dot{\alpha}_{890}\right)$  $y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $\vdash (\lambda x. \ (\mathbf{snd} \ (((,) \ (\mathbf{sync} \ (\mathbf{send} \ (((,) \ (\mathbf{channel} \ ()))) \ y)))) \ x)))$  $\underbrace{\left\{\alpha_{2} \subseteq \dot{\alpha}_{803}, \left\{\mathbf{CHAN} \ \dot{\alpha}_{803}\right\} \subseteq \beta_{28}, \left\{\beta_{122}, \beta_{146}, \beta_{180}, \beta_{204}, \beta_{30}, \beta_{37}, \beta_{71}, \beta_{88}\right\} \subseteq \beta_{235}, \left\{\beta_{13}\right\} \subseteq \beta_{146}, \left\{\beta_{17}\right\} \subseteq \dot{\beta}_{160}, \left\{\beta_{19}\right\} \subseteq \beta_{122}, \left\{\beta_{21}\right\} \subseteq \beta_{37}, \left\{\beta_{26}\right\} \subseteq \dot{\beta}_{41}, \left\{\beta_{28}\right\} \subseteq \beta_{30}, \left\{\dot{\beta}_{104}\right\} \subseteq \beta_{180}, \left\{\dot{\beta}_{41}\right\} \subseteq \beta_{71} \right\} }$  $\left\{\alpha_{2} \subseteq \dot{\alpha}_{803}, \left\{\mathbf{CHAN} \ \dot{\alpha}_{803}\right\} \subseteq \beta_{28}, \left\{\beta_{122}, \beta_{146}, \beta_{180}, \beta_{204}, \beta_{30}, \beta_{37}, \beta_{71}, \beta_{88}\right\} \subseteq \beta_{235}, \left\{\beta_{13}\right\} \subseteq \beta_{204}, \left\{\beta_{16}\right\} \subseteq \dot{\beta}_{160}, \left\{\beta_{19}\right\} \subseteq \dot{\beta}_{160}, \left\{\beta_{21}\right\} \subseteq \dot{\beta}_{104}, \left\{\beta_{25}\right\} \subseteq \dot{\beta}_{41}, \left\{\beta_{28}\right\} \subseteq \dot{\beta}_{41}, \left\{\dot{\beta}_{28}\right\} \subseteq \dot{\beta}_{19}, \left\{\dot{\beta}_{160}\right\} \subseteq \beta_{180}, \left\{\dot{\beta}_{41}\right\} \subseteq \beta_{71}\right\}$  $\sim_{\mathcal{R}} \left( \alpha_{10} \xrightarrow{\beta_{235}} \alpha_{10} \right) \& \left\{ \alpha_{2} \subseteq \dot{\alpha}_{803}, \left\{ \mathbf{CHAN} \ \dot{\alpha}_{803} \right\} \subseteq \beta_{28}, \left\{ \beta_{122} \right\} \subseteq \beta_{235}, \left\{ \beta_{13} \right\} \subseteq \beta_{235}, \left\{ \beta_{16} \right\} \subseteq \beta_{235$  $f \mapsto \forall . \{\} \Rightarrow \left(\dot{\alpha}_{885} \xrightarrow{\dot{\beta}_{252}} \dot{\alpha}_{890}\right)$  $y \mapsto \forall . \{\} \Rightarrow \alpha_2$  $\vdash \mathbf{if} \ \mathbf{True} \ \mathbf{then} \ f \ \mathbf{else} \ (\lambda x. \ (\mathbf{snd} \ (((,) \ (\mathbf{sync} \ (\mathbf{send} \ (((,) \ (\mathbf{channel} \ ())) \ y)))) \ x)))$  $\&\left\{\alpha_{2}\subseteq\dot{\alpha}_{803},\mathbf{Bool}\subseteq\mathbf{Bool},\left(\alpha_{10}\xrightarrow{\beta_{235}}\alpha_{10}\right)\subseteq\left(\dot{\alpha}_{250}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{252}}\dot{\alpha}_{890}\right)\subseteq\left(\dot{\alpha}_{250}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{252}}\dot{\alpha}_{890}\right)\subseteq\left(\dot{\alpha}_{250}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{252}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{252}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{252}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{252}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{252}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{252}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{252}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{253}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha}_{885}\xrightarrow{\dot{\beta}_{235}}\dot{\alpha}_{891}\right),\left(\dot{\alpha$  $\left\{\alpha_{2} \subseteq \dot{\alpha}_{803}, \mathbf{Bool} \subseteq \mathbf{Bool}, \left(\alpha_{10} \xrightarrow{\beta_{235}} \alpha_{10}\right) \subseteq \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{891}\right), \left(\dot{\alpha}_{885} \xrightarrow{\dot{\beta}_{252}} \dot{\alpha}_{890}\right) \subseteq \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{891}\right), \left(\dot{\alpha}_{885} \xrightarrow{\dot{\beta}_{252}} \dot{\alpha}_{891}\right), \left(\dot{\alpha}_{885} \xrightarrow{\dot{\beta}_{252}} \dot{\alpha}_{891}\right) \subseteq \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{891}\right), \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{891}\right) \subseteq \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{891}\right), \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{891}\right) \subseteq \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{891}\right) \subseteq \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{891}\right), \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{891}\right) \subseteq \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{250}\right) \subseteq \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{250}\right) \subseteq \left(\dot{\alpha}_{25$  $\mathcal{F}\left\{\alpha_{10} \subseteq \dot{\alpha}_{891}, \alpha_{2} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{250} \subseteq \alpha_{10}, \dot{\alpha}_{250} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{890} \subseteq \dot{\alpha}_{895}, \dot{\alpha}_{895} \subseteq \dot{\alpha}_{910}, \dot{\alpha}_{910} \subseteq \dot{\alpha}_{910}, \dot$  $\sim_{\mathcal{R}} \left( \dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{891} \right) \& \left\{ \alpha_2 \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{250} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{250} \subseteq \dot{\alpha}_{891}, \left\{ \dot{\beta}_{146} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{14} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{146} \right\}$  $\vdash ((,) \text{ if True then } f \text{ else } (\lambda x. \text{ (snd } (((,) \text{ (sync (send (((,) \text{ (channel ()))} y))))} \ x))))$  $\left\{ \alpha_{2} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{250} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{250} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{250} \subseteq \dot{\alpha}_{891}, \left( \dot{\alpha}_{333} \xrightarrow{\dot{\beta}_{337}} \dot{\alpha}_{334} \right) \xrightarrow{\beta_{8}} \left( \alpha_{7} \xrightarrow{\beta_{9}} \left( \dot{\alpha}_{333} \xrightarrow{\dot{\beta}_{337}} \dot{\alpha}_{334} \right) \times \alpha_{7} \right) \right) \right\} \subseteq \left( \dot{\alpha}_{253}, \{\beta_{10}\} \subseteq \beta_{235}, \{\beta_{10}\} \subseteq \beta_{235},$  $\left\{ \alpha_{2} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{250} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{250} \subseteq \dot{\alpha}_{891}, \dot{\alpha}_{890} \subseteq \dot{\alpha}_{891}, \left( \dot{\alpha}_{333} \xrightarrow{\dot{\beta}_{337}} \dot{\alpha}_{334} \right) \xrightarrow{\beta_{2}} \left( \dot{\alpha}_{406} \xrightarrow{\dot{\beta}_{235}}, \left\{ \beta_{12} \right\} \subseteq \beta_{235}, \left\{ \beta_{13} \right\} \subseteq \beta_$  $\forall \mathcal{F} \left\{ \alpha_{2} \subseteq \dot{\alpha}_{803}, \alpha_{7} \subseteq \dot{\alpha}_{309}, \dot{\alpha}_{250} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{250} \subseteq \dot{\alpha}_{887}, \left\{ \dot{\beta}_{21} \right\} \subseteq \beta_{235}, \left\{ \beta_{10} \right\} \subseteq \beta_{23$  $\sim_{\mathcal{R}} \left( \dot{\alpha}_{406} \xrightarrow{\dot{\beta}_{310}} \left( \left( \dot{\alpha}_{335} \xrightarrow{\dot{\beta}_{338}} \dot{\alpha}_{891} \right) \times \dot{\alpha}_{406} \right) \right) \& \left\{ \alpha_{2} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{335} \subseteq \dot{\alpha}_{891}, \dot{\alpha}_{890} \subseteq \dot{\alpha}_{891}, \left\{ \dot{\beta}_{235} \right\} \subseteq \dot{\beta}_{235}, \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{21} \right\} \subseteq \beta_{235}, \left$  $\vdash (((,) \text{ if True then } f \text{ else } (\lambda x. \text{ (snd } (((,) \text{ (sync (send (((,) \text{ (channel ()))} y))))} \ x)))) \ y)$  $\&\left\{\alpha_{2}\subseteq\dot{\alpha}_{803},\dot{\alpha}_{335}\subseteq\dot{\alpha}_{885},\dot{\alpha}_{335}\subseteq\dot{\alpha}_{885},\dot{\alpha}_{335}\subseteq\dot{\alpha}_{891},\left(\dot{\alpha}_{406}\xrightarrow{\dot{\beta}_{310}}\left(\left(\dot{\alpha}_{451}\xrightarrow{\dot{\beta}_{454}}\dot{\alpha}_{452}\right)\times\dot{\alpha}_{452}\right)\right),\left\{\mathbf{CHAN}\right.\\ \dot{\alpha}_{803}\subseteq\dot{\beta}_{235},\left\{\beta_{13}\right\}\subseteq\beta_{235},\left\{\beta_{13}\right\}\subseteq\beta_{235},\left\{\beta_{13}\right\}\subseteq\beta_{235},\left\{\beta_{13}\right\}\subseteq\beta_{235},\left\{\beta_{14}\right\}\subseteq\beta_{14},\left$  $\left\{\alpha_{2} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{335} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{335} \subseteq \dot{\alpha}_{881}, \dot{\alpha}_{890} \subseteq \dot{\alpha}_{891}, \left(\dot{\alpha}_{406} \xrightarrow{\dot{\beta}_{310}} \left(\left(\dot{\alpha}_{451} \xrightarrow{\dot{\beta}_{454}} \dot{\alpha}_{452}\right) \times \dot{\alpha}_{460}\right)\right) \subseteq \left(\alpha_{2} \xrightarrow{\beta_{404}} \left(\left(\dot{\alpha}_{451} \xrightarrow{\dot{\beta}_{454}} \dot{\alpha}_{452}\right) \times \dot{\alpha}_{460}\right)\right) \subseteq \left(\alpha_{2} \xrightarrow{\beta_{404}} \left(\left(\dot{\alpha}_{451} \xrightarrow{\dot{\beta}_{454}} \dot{\alpha}_{452}\right) \times \dot{\alpha}_{460}\right)\right) \subseteq \left(\dot{\alpha}_{235}, \{\dot{\beta}_{235}\} \subseteq \dot{\beta}_{235}, \{\dot{\beta}_{235}\} \subseteq \dot{\beta}_{235}, \{\dot{\beta}_{213}\} \subseteq \dot{\beta}_{235}, \{\dot{\beta}_{213}$  $\Rightarrow_{\mathcal{F}} \left\{ \alpha_{2} \subseteq \dot{\alpha}_{406}, \alpha_{2} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{335} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{335} \subseteq \dot{\alpha}_{891}, \dot{\alpha}_{406} \subseteq \dot{\alpha}_{453}, \dot{\alpha}_{451} \subseteq \dot{\alpha}_{335}, \dot{\alpha}_{890} \subseteq \dot{\beta}_{235}, \{\dot{\beta}_{13}\} \subseteq \dot{\beta}_{235}, \{\dot{\beta}_{146}\} \subseteq \dot{\beta}_{235}, \{\dot{\beta}_{246}\} \subseteq \dot{\beta}_{246}, \{\dot{\beta$  $\Rightarrow_{\mathcal{R}} \left( \left( \dot{\alpha}_{451} \xrightarrow{\dot{\beta}_{454}} \dot{\alpha}_{891} \right) \times \alpha_2 \right) \& \left\{ \alpha_2 \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{451} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{451} \subseteq \dot{\alpha}_{891}, \left\{ \dot{\beta}_{235} \right\} \subseteq \dot{\beta}_{235}, \left\{ \dot{\beta}_{310} \right\} \subseteq \dot{\beta}_{337}, \left\{ \dot{\beta}_{310} \right\} \subseteq \dot{\beta}_{337}, \left\{ \dot{\beta}_{310} \right\} \subseteq \dot{\beta}_{337}, \left\{ \dot{\beta}_{310} \right\} \subseteq \dot{\beta}_{235}, \left\{ \dot{\beta}_{310} \right\} \subseteq \dot{\beta}_{337}, \left\{ \dot{\beta}_{310} \right\} \subseteq \dot{\beta}_{310}, \left\{ \dot{\beta}_{310} \right\}$  $\beta_{235}, \{\beta_{31}\} \subseteq \beta_{235}, \{\beta_{31}\} \subseteq \beta_{31}, \{\beta_{31}\} \subseteq \beta_{31$  $\vdash (\mathbf{snd}\ (((,)\ \mathbf{if}\ \mathbf{True}\ \mathbf{then}\ f\ \mathbf{else}\ (\lambda x.\ (\mathbf{snd}\ (((,)\ (\mathbf{sync}\ (\mathbf{send}\ (((,)\ (\mathbf{channel}\ ()))\ y))))\ x))))\ y))$  $\&\left\{\alpha_{2}\subseteq\dot{\alpha}_{803},\dot{\alpha}_{451}\subseteq\dot{\alpha}_{885},\dot{\alpha}_{451}\subseteq\dot{\alpha}_{885},\dot{\alpha}_{451}\subseteq\dot{\alpha}_{891},\left(\left(\left(\dot{\alpha}_{818}\xrightarrow{\dot{\beta}_{568}}\dot{\alpha}_{567}\right)\times\dot{\alpha}_{499}\right)\stackrel{\beta_{5}}{\subseteq}\dot{\beta}_{235},\left\{\beta_{13}\right\}\subseteq\beta_{235},\left\{\beta_{13}\right\}\subseteq\beta_{235},\left\{\beta_{14}\right\}\subseteq\beta_{235},\left$  $-\frac{k\left\{\left(\dot{\alpha}_{880} \xrightarrow{\dot{\beta}_{744}} \dot{\alpha}_{739}\right) \subseteq \left(\dot{\alpha}_{742} \xrightarrow{\dot{\beta}_{746}} \dot{\alpha}_{914}\right), \left\{\mathbf{CHAN} \left(\dot{\alpha}_{742} \xrightarrow{\dot{\beta}_{746}} \dot{\alpha}_{914}\right)\right\} \subseteq \beta_{653}, \left\{\beta_{663}\right\} \subseteq \beta_{653}, \left\{\beta_{663}\right\} \subseteq \beta_{653}, \left\{\beta_{663}\right\} \subseteq \beta_{653}, \left\{\beta_{663}\right\} \subseteq \beta_{653}, \left\{\beta_{664}\right\} \subseteq \beta_{653}, \left\{\beta_{663}\right\} \subseteq \beta_{663}, \left\{\beta_{6$  $\left\{ \alpha_{2} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{451} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{451} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{451} \subseteq \dot{\alpha}_{891}, \left( \left( \left( \dot{\alpha}_{818} \xrightarrow{\dot{\beta}_{568}} \dot{\alpha}_{507} \right) \times \dot{\alpha}_{499} \right) \xrightarrow{\beta_{5}} \dot{\alpha}_{499} \right) \subseteq \left( \left( \left( \dot{\alpha}_{451} \xrightarrow{\dot{\beta}_{454}} \dot{\alpha}_{891} \right) \times \alpha_{2} \right) \xrightarrow{\beta_{498}} \dot{\alpha}_{51} \right) \times \alpha_{2} \right) \xrightarrow{\beta_{498}} \dot{\alpha}_{51} \right\} \subseteq \beta_{235}, \\ \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \\ \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \\ \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \\ \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \\ \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \\ \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{235}, \\ \left\{ \dot{\beta}_{31} \right\} \subseteq \beta_{315}, \\ \left\{$  $\&\left\{\alpha_{680}\subseteq\dot{\alpha}_{902}, \{\textbf{CHAN}\ \dot{\alpha}_{902}\}\subseteq\beta_{696}, \{\beta_{682}\}\subseteq\beta_{692}, \{\beta_{683}\}\subseteq\beta_{692}, \{\beta_{684}\}\subseteq\beta_{692}, \{\beta_{684}\}\subseteq\beta_{702}, \{\beta_{686}\}\subseteq\beta_{702}, \{\beta_{694}\}\subseteq\beta_{702}, \{\beta_{696}\}\subseteq\beta_{702}, \{\beta_{696}\}\subseteq\beta_{7$  $\Rightarrow_{\mathcal{F}} \left\{ \alpha_{2} \subseteq \dot{\alpha}_{499}, \alpha_{2} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{451} \subseteq \dot{\alpha}_{885}, \dot{\alpha}_{451} \subseteq \dot{\alpha}_{891}, \dot{\alpha}_{499} \subseteq \dot{\alpha}_{541}, \dot{\alpha}_{890} \subseteq \dot{\alpha}_{541}, \dot{\alpha}_{891} \subseteq \dot{\alpha}_{541}, \dot{\alpha}_{891} \subseteq \dot{\alpha}_{541}, \dot{\alpha}_{892} \subseteq \dot{\beta}_{104}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{12}, \left\{ \dot{\beta}_{41} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{13} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{13} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{13} \right\} \subseteq \beta_{235}, \left\{ \dot{\beta}_{14} \right\} \subseteq \beta_$  $\Rightarrow_{\mathcal{R}} \alpha_2 \& \left\{ \alpha_2 \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{818} \subseteq \dot{\alpha}_{895}, \dot{\alpha}_{818} \subseteq \dot{\alpha}_{895}, \dot{\alpha}_{818} \subseteq \dot{\alpha}_{891}, \dot{\alpha}_{890} \subseteq \dot{\beta}_{235}, \{\beta_{12}\} \subseteq \beta_{235}, \{\beta_{13}\} \subseteq \beta_{235}, \{\beta_{146}\} \subseteq \beta_{235}$  $\vdash (\lambda y. \ (\mathbf{snd} \ (((,) \ \mathbf{if} \ \mathbf{True} \ \mathbf{then} \ f \ \mathbf{else} \ (\lambda x. \ (\mathbf{snd} \ (((,) \ (\mathbf{sync} \ (\mathbf{send} \ (((,) \ (\mathbf{channel} \ ())) \ y)))) \ x)))) \ y)))$  $\&\left\{\alpha_{2}\subseteq\dot{\alpha}_{803},\dot{\alpha}_{818}\subseteq\dot{\alpha}_{885},\dot{\alpha}_{818}\subseteq\dot{\alpha}_{885},\dot{\alpha}_{818}\subseteq\dot{\alpha}_{891},\left\{\dot{\beta}_{235}\right\}\subseteq\dot{\beta}_{235},\left\{\dot{\beta}_{310}\right\}\subseteq\dot{\beta}_{310},\left\{\dot{\beta}_{310}\right\}\subseteq\dot{\beta}_{310},\left\{\dot{\beta}_{$  $\left\{\alpha_{2}\subseteq\dot{\alpha}_{803},\dot{\alpha}_{818}\subseteq\dot{\alpha}_{885},\dot{\alpha}_{818}\subseteq\dot{\alpha}_{885},\dot{\alpha}_{818}\subseteq\dot{\alpha}_{891},\left\{\dot{\beta}_{235}\}\subseteq\dot{\beta}_{235},\left\{\dot{\beta}_{12}\right\}\subseteq\dot{\beta}_{235},\left\{\dot{\beta}_{13}\right\}\subseteq\dot{\beta}_{235},\left\{\dot{\beta}_{13}\right\}\subseteq\dot{\beta}_{235},\left\{\dot{\beta}_{146}\right$  $\neg \mathcal{R}\left(\alpha_{2} \xrightarrow{\beta_{611}} \alpha_{2}\right) \& \left\{\alpha_{2} \subseteq \dot{\alpha}_{803}, \dot{\alpha}_{818} \subseteq \dot{\alpha}_{891}, \left\{\dot{\beta}_{235}\right\} \subseteq \dot{\beta}_{235}, \left\{\dot{\beta}_{13}\right\} \subseteq \beta_{235}, \left\{\dot{\beta}_{16}\right\} \subseteq \beta_{235}, \left\{\dot{\beta}_{16}\right\} \subseteq \beta_{235}, \left\{\dot{\beta}_{235}\right\} \subseteq \dot{\beta}_{235}, \left\{\dot{\beta}_{24}\right\} \subseteq \dot{\beta}_{245}, \left$  $f \mapsto \forall . \{\} \Rightarrow \left(\dot{\alpha}_{885} \xrightarrow{\dot{\beta}_{252}} \dot{\alpha}_{890}\right)$  $\vdash \mathbf{let} \ id = (\lambda y. \ (\mathbf{snd} \ (((,) \ \mathbf{if} \ \mathbf{True} \ \mathbf{then} \ f \ \mathbf{else} \ (\lambda x. \ (\mathbf{snd} \ (((,) \ (\mathbf{sync} \ (\mathbf{send} \ (((,) \ (\mathbf{channel} \ ())) \ y)))) \ x)))) \ in \ (id \ id)$  $\vdash (\lambda f. \ \mathbf{let} \ id = \ (\lambda y. \ (\mathbf{snd} \ (((,) \ \mathbf{if} \ \mathbf{True} \ \mathbf{then} \ f \ \mathbf{else} \ (\lambda x. \ (\mathbf{snd} \ (((,) \ (\mathbf{sync} \ (\mathbf{send} \ (((,) \ (\mathbf{channel} \ ())) \ y)))) \ x)))) \ \ in \ (id \ id))$ 

 $\alpha_{14} \mapsto \dot{\alpha}_{150}$   $\alpha_{179} \mapsto (\dot{\alpha}_{189} \times \dot{\alpha}_{190})$   $\alpha_{18} \mapsto \dot{\alpha}_{131}$   $\alpha_{1} \mapsto \left(\dot{\alpha}_{885} \xrightarrow{\dot{\beta}_{252}} \dot{\alpha}_{890}\right)$ 

 $\dot{\alpha}_{123} \mapsto \dot{\alpha}_{132}$  $\dot{\alpha}_{126} \mapsto \dot{\alpha}_{803}$  $\dot{\alpha}_{147} \mapsto \dot{\alpha}_{803}$  $\dot{\alpha}_{157} \mapsto \dot{\alpha}_{181}$  $\dot{\alpha}_{184} \mapsto \dot{\alpha}_{803}$  $\dot{\alpha}_{208} \mapsto \dot{\alpha}_{803}$  $\dot{\alpha}_{236} \mapsto \dot{\alpha}_{803}$  $\dot{\alpha}_{240} \mapsto \left(\dot{\alpha}_{250} \xrightarrow{\dot{\beta}_{253}} \dot{\alpha}_{891}\right)$