

SOS rules for Esterel V5

$$k \xrightarrow[E]{\emptyset, k} 0 \quad (\text{term})$$

$$!S \xrightarrow[E]{\{S\}, 0} 0 \quad (\text{emit})$$

$$\frac{S \in E \quad p \xrightarrow[E]{E_{p,k}} p'}{S ? p, q \xrightarrow[E]{E_{p,k}} p'} \quad (\text{pres+})$$

$$\frac{S \notin E \quad q \xrightarrow[E]{E_{q,k}} q'}{S ? p, q \xrightarrow[E]{E_{p,k}} q'} \quad (\text{pres-})$$

$$\frac{p \xrightarrow[E]{E_{p,k}} p' \quad k \neq 0}{p; q \xrightarrow[E]{E_{p,k}} p'; q} \quad (\text{seq1})$$

$$\frac{p \xrightarrow[E]{E_{p,0}} p' \quad q \xrightarrow[E]{E_{q,k}} q'}{p; q \xrightarrow[E]{E_{p \cup E_q, k}} q'} \quad (\text{seq2})$$

$$\frac{p \xrightarrow[E]{E_{p,k}} p' \quad q \xrightarrow[E]{E_{q,l}} q'}{p \mid q \xrightarrow[E]{E_{p \cup E_q, \max(k,l)}} p' \mid q'} \quad (\text{paral})$$

$$\frac{p \xrightarrow[E]{E_{p,k}} p' \quad k \neq 0}{p^* \xrightarrow[E]{E_{p,k}} p'; p^*} \quad (\text{loop})$$

$$\frac{p \xrightarrow[E]{E_{p,k}} p' \quad k \neq 0}{s \supset p \xrightarrow[E]{E_{p,k}} s \widehat{\supset} p'} \quad (susp1)$$

$$\frac{p \xrightarrow[E]{E_{p,0}} p'}{s \supset p \xrightarrow[E]{E_{p,0}} 0} \quad (susp2)$$

$$\frac{p \xrightarrow[E]{E_{p,k}} p' \quad (k = 0) \vee (k = 2)}{\{p\} \xrightarrow[E]{E_{p,0}} 0} \quad (trap1)$$

$$\frac{p \xrightarrow[E]{E_{p,k}} p' \quad (k = 1) \vee (k > 2)}{\{p\} \xrightarrow[E]{E_{p,\downarrow k}} \{p'\}} \quad (trap2)$$

$$\frac{p \xrightarrow[E]{E_{p,k}} p'}{\uparrow p \xrightarrow[E]{E_{p,\uparrow k}} \uparrow p'} \quad (shift)$$

$$\downarrow k = \begin{cases} 0 & \text{if } (k = 0) \vee (k = 2) \\ 1 & \text{if } k = 1 \\ k - 1 & \text{if } k > 2 \end{cases}$$

$$\uparrow k = \begin{cases} k & \text{if } (k = 0) \vee (k = 1) \\ k + 1 & \text{if otherwise} \end{cases}$$

$$\begin{array}{c}
\frac{p \xrightarrow[E \setminus \{s\}]{E_{p,k}} p' \quad s \notin E_p}{p \setminus s \xrightarrow[E]{E_{p,k}} p' \setminus s} \quad (sig-) \qquad \frac{p \xrightarrow[E \cup \{s\}]{E_{p,k}} p' \quad s \in E_p}{p \setminus s \xrightarrow[E]{E_{p \setminus \{s\},k}} p' \setminus s} \quad (sig+)
\end{array}$$

$$(s \widehat{\supset} p) \equiv s \supset ((s ? 1, 0); p) \quad \text{Suspend immediate}$$

$$s > p \equiv \left\{ (\uparrow p; 2) \mid (1; s ? 2, 0)^* \right\} \quad \text{Weak abort}$$

$$s \gg p \equiv s > (s \supset p) \equiv \left\{ ((s \supset \uparrow p); 2) \mid (1; s ? 2, 0)^* \right\} \quad \text{Strong abort}$$

$$s > 1^* \equiv s \gg 1^* \equiv \left\{ (1; s ? 2, 0)^* \right\} \equiv 1; \left\{ (s ? 2, 1)^* \right\} \quad \text{Await } s$$