

Algorithm:  $[y] := \text{SYM\_XPY\_UNB\_VAR1}(A, x, y)$

$$A \rightarrow \left( \begin{array}{c|c} A_{TL} & A_{TR} \\ \hline A_{BL} & A_{BR} \end{array} \right), x \rightarrow \left( \begin{array}{c} x_T \\ \hline x_B \end{array} \right), y \rightarrow \left( \begin{array}{c} y_T \\ \hline y_B \end{array} \right)$$

where  $A_{TL}$  is  $0 \times 0$ ,  $x_T$  has 0 rows,  $y_T$  has 0 rows

while  $m(A_{TL}) < m(A)$  do

$$\left( \begin{array}{c|c} A_{TL} & A_{TR} \\ \hline A_{BL} & A_{BR} \end{array} \right) \rightarrow \left( \begin{array}{c|c|c} A_{00} & a_{01} & A_{02} \\ \hline a_{10}^T & \alpha_{11} & a_{12}^T \\ \hline A_{20} & a_{21} & A_{22} \end{array} \right), \left( \begin{array}{c} x_T \\ \hline x_B \end{array} \right) \rightarrow \left( \begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array} \right), \left( \begin{array}{c} y_T \\ \hline y_B \end{array} \right) \rightarrow \left( \begin{array}{c} y_0 \\ \hline \psi_1 \\ \hline y_2 \end{array} \right)$$

where  $\alpha_{11}$  is  $1 \times 1$ ,  $\chi_1$  has 1 row,  $\psi_1$  has 1 row

update line 1

:

update line n

$$\left( \begin{array}{c|c} A_{TL} & A_{TR} \\ \hline A_{BL} & A_{BR} \end{array} \right) \leftarrow \left( \begin{array}{c|c|c} A_{00} & a_{01} & A_{02} \\ \hline a_{10}^T & \alpha_{11} & a_{12}^T \\ \hline A_{20} & a_{21} & A_{22} \end{array} \right), \left( \begin{array}{c} x_T \\ \hline x_B \end{array} \right) \leftarrow \left( \begin{array}{c} x_0 \\ \hline \chi_1 \\ \hline x_2 \end{array} \right), \left( \begin{array}{c} y_T \\ \hline y_B \end{array} \right) \leftarrow \left( \begin{array}{c} y_0 \\ \hline \psi_1 \\ \hline y_2 \end{array} \right)$$

endwhile