Step	Algorithm: $[C] := \text{SYR}2\text{K\_LN\_BLK\_VAR}4(A, B, C)$
1a	$\{C = \widehat{C} $
	$C \to \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right), A \to \left(\begin{array}{c c} A_T \\ \hline A_B \end{array}\right), B \to \left(\begin{array}{c c} B_T \\ \hline B_B \end{array}\right)$ where $C_{TL}$ is $0 \times 0$ , $A_T$ has 0 rows, $B_T$ has 0 rows
2	$ \left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) $
3	while $m(C_{TL}) < m(C)$ do
2,3	$ \left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \land m(C_{TL}) < m(C) $
	Determine block size $b$
5a	$ \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \to \left(\begin{array}{c c} C_{00} & * & * \\ \hline C_{10} & C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right), \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \to \left(\begin{array}{c c} A_0 \\ \hline A_1 \\ \hline A_2 \end{array}\right), \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \to \left(\begin{array}{c} B_0 \\ \hline B_1 \\ \hline B_2 \end{array}\right) $ where $C_{11}$ is $b \times b$ , $A_1$ has $b$ row, $B_1$ has $b$ row
6	$ \left\{ \begin{array}{c c} C_{11} & \text{is } b \times b, A_1 & \text{has } b \text{ row}, B_1 & \text{has } b \text{ row} \\ \hline \left\{ \begin{array}{c c} C_{00} & * & * \\ \hline C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{array}\right\} = \left(\begin{array}{c c} A_0 B_0^T + B_0 A_0^T + \hat{C}_{00} & * & * \\ \hline B_1 A_0^T + \hat{C}_{10} & C_{11} & * \\ B_2 A_0^T + \hat{C}_{20} & C_{21} & C_{22} \end{array}\right) $
8	$C_{11} := A_1 B_1^T + B_1 A_1^T + C_{11}$ $C_{10} := A_1 B_0^T + C_{10}$ $C_{21} := B_2 A_1^T + C_{21}$
7	$ \left\{ \begin{array}{c cc} C_{00} & * & * \\ C_{10} & C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array} \right) = \left( \begin{array}{c cc} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & * & * \\ A_1 B_0^T + B_1 A_0^T + \widehat{C}_{10} & A_1 B_1^T + B_1 A_1^T + \widehat{C}_{11} & * \\ \hline B_2 A_0^T + \widehat{C}_{20} & B_2 A_1^T + \widehat{C}_{21} & C_{22} \end{array} \right) $
5b	$\begin{pmatrix} C_{00} & * & * & \\ & & & \\$
2	$ \left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) $
	endwhile
2,3	$\left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \land \neg (m(C_{TL}) < m(C))$
1b	$\left\{ [C] = \operatorname{syr}2k \ln(A, B, \widehat{C}) \right\}$

Step	Algorithm: $[C] := \text{SYR}2\text{K\_LN\_BLK\_VAR}4(A, B, C)$
1a	{
4	
	where
2	
3	while do
2,3	$igg  \left\{ igg  igwedge $
	Determine block size b
5a	
	where
6	
8	
7	
5b	
2	
	endwhile
2,3	$\left\{ \begin{array}{c} & & \\ & & \\ \end{array} \right. $
1b	<b>\{</b>

Step	Algorithm: $[C] := \text{SYR}2\text{K\_LN\_BLK\_VAR}4(A, B, C)$
1a	$\{C = \widehat{C}$
4	where
2	
3	while do
2,3	
5a	
	where
6	
8	
7	
5b	
2	
	endwhile
2,3	$\left\{ \begin{array}{c} \wedge \neg ( \end{array} \right. $
1b	$\{ [C] = \operatorname{syr}2k \ln(A, B, \widehat{C}) $

Step	Algorithm: $[C] := \text{SYR}2\text{K_LN_BLK_VAR}4(A, B, C)$
1a	$\{C = \widehat{C} $
4	where
2	$\left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right)$
3	while do
2,3	$\left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \wedge \right.$
	Determine block size $b$
5a	
	where
6	
8	
7	
5b	
2	$ \left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) $
	endwhile
2,3	$ \left\{ \left( \frac{C_{TL}}{C_{BL}} \middle  * \atop C_{BR} \right) = \left( \frac{A_T B_T^T + B_T A_T^T + \widehat{C}_{TL}}{B_B A_T^T + \widehat{C}_{BL}} \middle  * \atop \widehat{C}_{BR} \right) \land \neg ( ) \right\} $
1b	$\left\{ [C] = \operatorname{syr}2k \ln(A, B, \widehat{C}) \right\}$

Step	Algorithm: $[C] := \text{SYR}2\text{K\_LN\_BLK\_VAR}4(A, B, C)$	
1a	${C = \widehat{C}}$	}
4	where	
2	$\left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right)$	$igg\}$
3	while $m(C_{TL}) < m(C)$ do	
2,3	$ \left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \wedge m(C_{TL}) < m(C) $	$igg\}$
	Determine block size $b$	
5a		
	where	
6		$\left. \right\}$
8		
7		$\left.\begin{array}{c} \\ \end{array}\right\}$
5b		
2	$ \left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) $	$\left. \right\}$
	endwhile	
2,3	$\left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \land \neg (m(C_{TL}) < m(C))$	
1b	$\{[C] = \operatorname{syr}2k \ln(A, B, \widehat{C})$	}

Step	Algorithm: $[C] := \text{SYR}2\text{K\_LN\_BLK\_VAR}4(A, B, C)$
1a	${C = \widehat{C}}$
4	$C \to \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right), A \to \left(\begin{array}{c c} A_T \\ \hline A_B \end{array}\right), B \to \left(\begin{array}{c c} B_T \\ \hline B_B \end{array}\right)$ where $C_{TL}$ is $0 \times 0$ , $A_T$ has 0 rows, $B_T$ has 0 rows
2	$ \left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) $
3	while $m(C_{TL}) < m(C)$ do
2,3	$\left\{ \begin{array}{c c} \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \wedge m(C_{TL}) < m(C) \end{array} \right\}$
	Determine block size b
5a	
	where
6	\[     \]
8	
7	
5b	
2	$ \left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) $
	endwhile
2,3	$\left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \wedge \neg (m(C_{TL}) < m(C)) $
1b	$\left\{ [C] = \operatorname{syr}2\mathrm{k.ln}(A, B, \widehat{C}) \right\}$

Step	Algorithm: $[C] := \text{SYR}2\text{K\_LN\_BLK\_VAR}4(A, B, C)$
1a	$\{C = \widehat{C}$
4	$C \to \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right), A \to \left(\begin{array}{c c} A_T \\ \hline A_B \end{array}\right), B \to \left(\begin{array}{c c} B_T \\ \hline B_B \end{array}\right)$ where $C_{TL}$ is $0 \times 0$ , $A_T$ has 0 rows, $B_T$ has 0 rows
2	$ \left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) $
3	while $m(C_{TL}) < m(C)$ do
2,3	$\left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right\} = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \wedge m(C_{TL}) < m(C)$
5a	Determine block size $b$ $ \begin{pmatrix} C_{TL} & * \\ C_{BL} & C_{BR} \end{pmatrix} \rightarrow \begin{pmatrix} C_{00} & * & * \\ C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{pmatrix}, \begin{pmatrix} A_T \\ A_B \end{pmatrix} \rightarrow \begin{pmatrix} A_0 \\ A_1 \\ A_2 \end{pmatrix}, \begin{pmatrix} B_T \\ B_B \end{pmatrix} \rightarrow \begin{pmatrix} B_0 \\ B_1 \\ B_2 \end{pmatrix} $ where $C_{11}$ is $b \times b$ , $A_1$ has $b$ row, $B_1$ has $b$ row
6	
8	
7	
5b	$egin{pmatrix} egin{pmatrix} C_{BL} & C_{BR} \end{pmatrix} & egin{pmatrix} C_{20} & C_{21} & C_{22} \end{pmatrix} & egin{pmatrix} A_B \end{pmatrix} & egin{pmatrix} A_B \end{pmatrix} & egin{pmatrix} B_B \end{pmatrix} & egin{pmatrix} B_2 \end{pmatrix} & egin{pmatrix} B_2$
2	$ \left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) $
	endwhile
2,3	$\left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \land \neg (m(C_{TL}) < m(C))$
1b	$\{[C] = \operatorname{syr}2k.\ln(A, B, \widehat{C}) $

Step	Algorithm: $[C] := \text{SYR}2\text{K_LN_BLK_VAR}4(A, B, C)$	
1a	$\{C=\widehat{C}$	}
4	$C \to \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right), A \to \left(\begin{array}{c c} A_T \\ \hline A_B \end{array}\right), B \to \left(\begin{array}{c c} B_T \\ \hline B_B \end{array}\right)$ where $C_{TL}$ is $0 \times 0$ , $A_T$ has 0 rows, $B_T$ has 0 rows	
2	$\left\{ \begin{pmatrix} C_{TL} & * \\ C_{BL} & C_{BR} \end{pmatrix} = \begin{pmatrix} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{pmatrix} \right.$	
3	while $m(C_{TL}) < m(C)$ do	
2,3	$\left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \wedge m(C_{TL}) < m(C)$	igg
5a	$\begin{pmatrix} C_{BL} & C_{BR} \end{pmatrix} \begin{pmatrix} C_{20} & C_{21} & C_{22} \end{pmatrix} \begin{pmatrix} A_B \end{pmatrix} \begin{pmatrix} A_B \end{pmatrix} \begin{pmatrix} A_2 \end{pmatrix} \begin{pmatrix} B_B \end{pmatrix} \begin{pmatrix} B_2 \end{pmatrix}$ where $C_{11}$ is $h \times h$ A <sub>1</sub> has $h$ row $B_1$ has $h$ row	
6	$ \left\{ \begin{array}{c cc} C_{00} & * & * \\ \hline C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{array}\right\} = \left(\begin{array}{c cc} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & * & * \\ \hline B_1 A_0^T + \widehat{C}_{10} & C_{11} & * \\ B_2 A_0^T + \widehat{C}_{20} & C_{21} & C_{22} \end{array}\right) $	$\left.\begin{array}{c} \\ \end{array}\right\}$
8		
7		$\left. \begin{array}{c} \\ \end{array} \right\}$
5b	$ \left(\begin{array}{c c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c c c} C_{00} & * & * \\ \hline C_{10} & C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right), \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ A_1 \\ \hline A_2 \end{array}\right), \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ B_1 \\ \hline B_2 \end{array}\right) $	
2	$ \left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) $	igg
	endwhile	
2,3	$\left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \wedge \neg (m(C_{TL}) < m(C))$	$\bigg\}$
1b	$\{[C] = \operatorname{syr}2k \ln(A, B, \widehat{C})$	}

Step	Algorithm: $[C] := \text{SYR}2\text{K\_LN\_BLK\_VAR}4(A, B, C)$
1a	$\{C = \widehat{C}$
4	$C \to \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right), A \to \left(\begin{array}{c c} A_T \\ \hline A_B \end{array}\right), B \to \left(\begin{array}{c c} B_T \\ \hline B_B \end{array}\right)$ where $C_{TL}$ is $0 \times 0$ , $A_T$ has 0 rows, $B_T$ has 0 rows
2	$\left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right)$
3	while $m(C_{TL}) < m(C)$ do
2,3	$\left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right\} = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \wedge m(C_{TL}) < m(C) $
5a	Determine block size $b$ $ \begin{pmatrix} C_{TL} & * \\ C_{BL} & C_{BR} \end{pmatrix} \rightarrow \begin{pmatrix} C_{00} & * & * \\ C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{pmatrix}, \begin{pmatrix} A_T \\ A_B \end{pmatrix} \rightarrow \begin{pmatrix} A_0 \\ A_1 \\ A_2 \end{pmatrix}, \begin{pmatrix} B_T \\ B_B \end{pmatrix} \rightarrow \begin{pmatrix} B_0 \\ B_1 \\ B_2 \end{pmatrix} $ where $C_{11}$ is $b \times b$ , $A_1$ has $b$ row, $B_1$ has $b$ row
6	$ \left\{ \begin{array}{c c} C_{00} & * & * \\ \hline C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{array} \right) = \left( \begin{array}{c c} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & * & * \\ \hline B_1 A_0^T + \widehat{C}_{10} & C_{11} & * \\ B_2 A_0^T + \widehat{C}_{20} & C_{21} & C_{22} \end{array} \right) $
8	
7	$ \left\{ \begin{array}{c cccc} C_{00} & * & * \\ C_{10} & C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array} \right) = \left( \begin{array}{c cccc} A_0 B_0^T + B_0 A_0^T + \hat{C}_{00} & * & * \\ A_1 B_0^T + B_1 A_0^T + \hat{C}_{10} & A_1 B_1^T + B_1 A_1^T + \hat{C}_{11} & * \\ \hline B_2 A_0^T + \hat{C}_{20} & B_2 A_1^T + \hat{C}_{21} & C_{22} \end{array} \right) $
5b	$\begin{pmatrix} C_{BL} \mid C_{BR} \end{pmatrix} \qquad \begin{pmatrix} \overline{C_{20} \mid C_{21} \mid C_{22} \end{pmatrix}} \qquad \begin{pmatrix} A_B \end{pmatrix} \qquad \begin{pmatrix} \overline{A_2} \end{pmatrix} \qquad \begin{pmatrix} B_B \end{pmatrix} \qquad \begin{pmatrix} \overline{B_2} \end{pmatrix}$
2	$\left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right)$
	endwhile
2,3	$ \left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \land \neg (m(C_{TL}) < m(C))  $
1b	$\{ [C] = \operatorname{syr}2k \ln(A, B, \widehat{C}) $

Step	Algorithm: $[C] := \text{SYR}2\text{K\_LN\_BLK\_VAR}4(A, B, C)$
1a	$\{C = \widehat{C}\}$
4	$C \to \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right), A \to \left(\begin{array}{c c} A_T \\ \hline A_B \end{array}\right), B \to \left(\begin{array}{c c} B_T \\ \hline B_B \end{array}\right)$ where $C_{TL}$ is $0 \times 0$ , $A_T$ has 0 rows, $B_T$ has 0 rows
2	$ \left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) $
3	while $m(C_{TL}) < m(C)$ do
2,3	$\left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right\} = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \wedge m(C_{TL}) < m(C) $
5a	Determine block size $b$ $ \begin{pmatrix} C_{TL} & * \\ C_{BL} & C_{BR} \end{pmatrix} \rightarrow \begin{pmatrix} C_{00} & * & * \\ C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{pmatrix}, \begin{pmatrix} A_T \\ A_B \end{pmatrix} \rightarrow \begin{pmatrix} A_0 \\ A_1 \\ A_2 \end{pmatrix}, \begin{pmatrix} B_T \\ B_B \end{pmatrix} \rightarrow \begin{pmatrix} B_0 \\ B_1 \\ B_2 \end{pmatrix} $ where $C_{11}$ is $b \times b$ , $A_1$ has $b$ row, $B_1$ has $b$ row
6	$ \left\{ \begin{array}{c c} C_{00} & * & * \\ \hline C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{array} \right) = \left( \begin{array}{c c} A_0 B_0^T + B_0 A_0^T + \hat{C}_{00} & * & * \\ \hline B_1 A_0^T + \hat{C}_{10} & C_{11} & * \\ B_2 A_0^T + \hat{C}_{20} & C_{21} & C_{22} \end{array} \right) $
8	$C_{11} := A_1 B_1^T + B_1 A_1^T + C_{11}$ $C_{10} := A_1 B_0^T + C_{10}$ $C_{21} := B_2 A_1^T + C_{21}$
7	$ \left\{ \begin{array}{c cccc} C_{00} & * & * \\ C_{10} & C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array} \right) = \left( \begin{array}{c cccc} A_0 B_0^T + B_0 A_0^T + \hat{C}_{00} & * & * \\ A_1 B_0^T + B_1 A_0^T + \hat{C}_{10} & A_1 B_1^T + B_1 A_1^T + \hat{C}_{11} & * \\ \hline B_2 A_0^T + \hat{C}_{20} & B_2 A_1^T + \hat{C}_{21} & C_{22} \end{array} \right) $
5b	$\left( \begin{array}{c c} C_{BL} & C_{BR} \end{array} \right) \left( \begin{array}{c} C_{20} & C_{21} \\ C_{22} \end{array} \right) \left( \begin{array}{c} A_B \end{array} \right) \left( \begin{array}{c} A_B \end{array} \right) \left( \begin{array}{c} B_B \end{array} \right) \left( \begin{array}{c} B_2 \\ B_2 \end{array} \right)$
2	$ \left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) $
	endwhile
2,3	$\left\{ \left( \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \land \neg (m(C_{TL}) < m(C)) $
1b	$\{[C] = \operatorname{syr}2k \ln(A, B, \widehat{C}) $

Algorithm: $[C] := \text{SYR}2\text{K\_LN\_BLK\_VAR}4(A, B, C)$
$C \to \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right), A \to \left(\begin{array}{c c} A_T \\ \hline A_B \end{array}\right), B \to \left(\begin{array}{c c} B_T \\ \hline B_B \end{array}\right)$ where $C_{TL}$ is $0 \times 0$ , $A_T$ has 0 rows, $B_T$ has 0 rows
while $m(C_{TL}) < m(C)$ do
Determine block size $b$ $ \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \rightarrow \left(\begin{array}{c c} C_{00} & * & * \\ \hline C_{10} & C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right), \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c c} A_0 \\ \hline A_1 \\ \hline A_2 \end{array}\right), \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \rightarrow \left(\begin{array}{c} B_0 \\ \hline B_1 \\ \hline B_2 \end{array}\right) $ where $C_{11}$ is $b \times b$ , $A_1$ has $b$ row, $B_1$ has $b$ row
$C_{11} := A_1 B_1^T + B_1 A_1^T + C_{11}$
$C_{10} := A_1 B_0^T + C_{10}$
$C_{21} := B_2 A_1^T + C_{21}$
$ \left(\begin{array}{c c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c c c} C_{00} & * & * \\ \hline C_{10} & C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right), \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ A_1 \\ \hline A_2 \end{array}\right), \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ B_1 \\ \hline B_2 \end{array}\right) $
endwhile

Algorithm:  $[C] := SYR2K_LN_BLK_VAR4(A, B, C)$ 

$$C o \left( \begin{array}{c|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) , A o \left( \begin{array}{c|c} A_T \\ \hline A_B \end{array} \right) , B o \left( \begin{array}{c|c} B_T \\ \hline B_B \end{array} \right)$$

where  $C_{TL}$  is  $0 \times 0$ ,  $A_T$  has 0 rows,  $B_T$  has 0 rows

while  $m(C_{TL}) < m(C)$  do

Determine block size b

$$\left(\begin{array}{c|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \rightarrow \left(\begin{array}{c|c} C_{00} & * & * \\ \hline C_{10} & C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right) , \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \rightarrow \left(\begin{array}{c} A_0 \\ \hline A_1 \\ A_2 \end{array}\right) , \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \rightarrow \left(\begin{array}{c} B_0 \\ \hline B_1 \\ B_2 \end{array}\right)$$

where  $C_{11}$  is  $b \times b$ ,  $A_1$  has b row,  $B_1$  has b row

$$C_{11} := A_1 B_1^T + B_1 A_1^T + C_{11}$$

$$C_{10} := A_1 B_0^T + C_{10}$$

$$C_{21} := B_2 A_1^T + C_{21}$$

$$\left(\begin{array}{c|c|c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c|c|c} C_{00} & * & * \\ \hline C_{10} & C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right) , \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c} A_0 \\ A_1 \\ \hline A_2 \end{array}\right) , \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \leftarrow \left(\begin{array}{c} B_0 \\ B_1 \\ \hline B_2 \end{array}\right)$$

endwhile