Step Algorithm: $[C] := \text{SYR2K_LN_BLK_VAR4}(A, B, C)$ 1a $\{C = \widehat{C}\}$	
	}
$ \begin{array}{ccc} 4 & C \to \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right), A \to \left(\begin{array}{c} A_T \\ \hline A_B \end{array}\right), B \to \left(\begin{array}{c} B_T \\ \hline B_B \end{array}\right) \\ & \text{where } C_{TL} \text{ is } 0 \times 0, A_T \text{ has } 0 \text{ rows}, B_T \text{ has } 0 \text{ rows} \end{array} $	
$ 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\{ \left(\frac{C_{TL}}{C_{BL}} \right * \atop C_{BL} 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}} \right * \atop \widehat{C}_{BR} $	$\wedge m(C_{TL}) < m(C)$
5a $ \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 c} A_T \\ \hline A_B \end{array} \right) \rightarrow \left(\begin{array}{c c} A_T \\ \hline A_B \end{array} \right) \rightarrow \left(\begin{array}{c c} C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array} \right), \left(\begin{array}{c c} A_T \\ \hline A_B \end{array} \right) \rightarrow \left(\begin{array}{c c} C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array} \right), \left(\begin{array}{c c} C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array} \right), \left(\begin{array}{c c} C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array} \right), \left(\begin{array}{c c} C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array} \right), \left(\begin{array}{c c} C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array} \right)$	$\langle A_2 \rangle$
$ \begin{cases} \begin{pmatrix} C_{00} & * & * \\ C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & * \\ B_1 A_0^T + \widehat{C}_{10} & C_{11} \\ B_2 A_0^T + \widehat{C}_{20} & C_{21} \end{cases} $	$\left.egin{array}{c} * \ * \ C_{22} \end{array} ight)$
8 $C_{11} := A_1 B_1^T + B_1 A_1^T + C_{11}$ $C_{10} := A_1 B_0^T + C_{10}$ $C_{21} := B_2 A_1^T + C_{21}$	
$ \begin{cases} \begin{pmatrix} C_{00} & * & * \\ C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} 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_2 A_0^T + \widehat{C}_{20} & B_1 A_1^T + \widehat{C}_{20} \end{cases} $	$egin{array}{cccccccccccccccccccccccccccccccccccc$
5b $\left(\begin{array}{c c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c c c} C_{00} & * & * \\ \hline C_{10} & C_{11} & * \\ \hline C_{20} & C_{21} & C_{22} \end{array}\right), \left(\begin{array}{c c c} A_T \\ \hline A_B \end{array}\right) \leftarrow \left(\begin{array}{c c c} C_{10} & C_{11} & * \\ \hline \end{array}\right)$	\ -/
$2 \left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left(\begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right)$	
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 $\left\{ [C] = \operatorname{syr}2k \ln(A, B, \widehat{C}) \right\}$	}

1a { } 4 where } 3 while do 2.3 A A 5a Determine block size b 8 where 6 \$ 5b \$ 2 endwhile 2.3 A¬(1b {	Step	Algorithm: $[C] := \text{SYR}2\text{K_LN_BLK_VAR}4(A, B, C)$	
where 2	1a	{	
2	4	1	
2,3	2		}
Determine block size b where	3	while do	
5a where	2,3		
8 7 {	5a		
7 { 5b 2 { endwhile 2,3 {	6		}
5b 2 { endwhile 2,3 {	8		
2 { endwhile 2,3 {	7		}
endwhile 2,3 \[\lambda \cdot \cdo	5b		
2,3 {	2		}
		endwhile	
1b {	2,3	$\left\{ \begin{array}{c} \\ \\ \end{array} \right. $	
	1b	{	

Step	Algorithm: $[C] := \text{SYR2K_LN_BLK_VAR4}(A, B, C)$
1a	$\{C = \widehat{C}\}$
4	
4	
	where
2	
3	while do
2,3	$\left\{ \begin{array}{c} \wedge \end{array} \right.$
	Determine block size b
F .	
5a	
	where
6	
8	
0	
7	}
5b	
2	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
	endwhile
2,3	$\wedge \neg (\hspace{1cm})$
1 L	
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	$\left\{ \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left(\begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right)$	
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 $	
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 () () () () () () () () () (1
2,3	$ \left\{ \left(\frac{C_{TL}}{C_{BL}} \middle * \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 * \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) $	$\left. \begin{array}{c} \end{array} \right\}$
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) $	igg
	Determine block size b	
5a		
	where	
6		$\left. ight\}$
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) $	igg
	endwhile	
2,3	$\left\{ \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left(\begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \wedge \neg (m(C_{TL}) < m(C))$	igg
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	$C \to \begin{pmatrix} C_{TL} & * \\ C_{BL} & C_{BR} \end{pmatrix}, A \to \begin{pmatrix} A_T \\ A_B \end{pmatrix}, B \to \begin{pmatrix} B_T \\ B_B \end{pmatrix}$ where C_{TL} is 0×0 , 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
C	
6	
8	
7	
5b	
0	$\left\{ \begin{array}{c c} C_{TL} & * \\ \hline \end{array} \right\} = \left(\begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline \end{array} \right)$
2	$\left(\begin{array}{c c} C_{BL} & C_{BR} \end{array}\right) \left(\begin{array}{c c} B_B A_T^T + C_{BL} & C_{BR} \end{array}\right)$
	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	$\left\{ [C] = \operatorname{syr}2\mathrm{k.ln}(A, B, \widehat{C}) \right\}$

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 0×0 , 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) $	$oxed{\ }$
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	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		$\left.\begin{array}{c} \end{array}\right\}$
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	$\left\{ \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left(\begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \land \neg (m(C_{TL}) < m(C))$	igg
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 0×0 , 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) $	owedge
3	while $m(C_{TL}) < m(C)$ do	
2,3	$\left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right\} = \left(\begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \wedge m(C_{TL}) < m(C)$	$\left. \begin{array}{c} \\ \end{array} \right\}$
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	$ \frac{\text{where } C_{11} \text{ is } b \times b, A_1 \text{ has } b \text{ row}, B_1 \text{ has } b \text{ row}}{\left\{ \begin{pmatrix} C_{00} & * & * \\ C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & * & * \\ B_1 A_0^T + \widehat{C}_{10} & C_{11} & * \\ B_2 A_0^T + \widehat{C}_{20} & C_{21} & C_{22} \end{pmatrix} \right\} $	$\left. \right\}$
8		
7		$\left. \begin{array}{c} \\ \end{array} \right\}$
5b	$C_{20} C_{21} C_{22} $ $C_{22} C_{21} C_{22} $	
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	$\left\{ \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left(\begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \land \neg (m(C_{TL}) < m(C))$	$\left. \begin{array}{c} \\ \end{array} ight\}$
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 0×0 , 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) $	$oxed{\ }$
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) $	$\left. \begin{array}{c} \\ \end{array} \right\}$
5a	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	
6	$ \begin{cases} \begin{pmatrix} C_{00} & * & * \\ C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \hat{C}_{00} & * & * \\ B_1 A_0^T + \hat{C}_{10} & C_{11} & * \\ B_2 A_0^T + \hat{C}_{20} & C_{21} & C_{22} \end{pmatrix} $	$\left. \begin{array}{c} \\ \end{array} \right\}$
8		
7	$ \begin{cases} \begin{pmatrix} C_{00} & * & * \\ C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} 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} & * \\ B_2 A_0^T + \hat{C}_{20} & B_2 A_1^T + \hat{C}_{21} & C_{22} \end{cases} $	$\left. \begin{array}{c} \\ \end{array} \right\}$
5b	$\begin{pmatrix} C_{00} & * & * & \\ & & & \\$	
2	$\left\{ \begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left(\begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right)$	igg
	endwhile	
2,3	$\left\{ \left(\begin{array}{c c} C_{TL} & * \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left(\begin{array}{c c} A_T B_T^T + B_T A_T^T + \widehat{C}_{TL} & * \\ \hline B_B A_T^T + \widehat{C}_{BL} & \widehat{C}_{BR} \end{array} \right) \land \neg (m(C_{TL}) < m(C))$	$\bigg\}$
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 0×0 , 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	$ \begin{cases} C_{00} & * & * \\ C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{cases} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & * & * \\ B_1 A_0^T + \widehat{C}_{10} & C_{11} & * \\ B_2 A_0^T + \widehat{C}_{20} & C_{21} & C_{22} \end{pmatrix} $
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{pmatrix} C_{00} & * & * \\ C_{10} & C_{11} & * \\ C_{20} & C_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} 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} & * \\ B_2 A_0^T + \widehat{C}_{20} & B_2 A_1^T + \widehat{C}_{21} & C_{22} \end{pmatrix} $
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	$\left\{ [C] = \operatorname{syr}2\mathrm{k.ln}(A, B, \widehat{C}) \right\}$

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 0×0 , 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