Step	Algorithm:		
1a			
4			
	where		
2			
3	while do		
2,3		٨	
5a			
	where		
6			
8			
5b			
7			
2			
	endwhile		
2,3		^ ¬(	)
1b			

Step	Algorithm: $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A  o \left(\frac{A_T}{A_B}\right), B  o \left(\frac{B_T}{B_B}\right), C  o \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right)$
2	where $A_T$ has 0 rows, $B_T$ has 0 rows, $C_{TL}$ is $0 \times 0$ $ \left(\begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right) = \left(\begin{array}{c c} \widehat{C}_{TL} + A_T B_T^T + B_T A_T^T   \widehat{C}_{TR} \\ \hline \widehat{C}_{BL} & \widehat{C}_{BR} \end{array}\right) $
3	while $m(A_T) < m(A)$ do
2,3	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T   \widehat{C}_{TR}}{\widehat{C}_{BL}} \right) \wedge m(A_T) < m(A) $
5a	$ \left(\frac{A_T}{A_B}\right) \to \left(\frac{A_0}{\frac{a_1^T}{A_2}}\right), \left(\frac{B_T}{B_B}\right) \to \left(\frac{B_0}{\frac{b_1^T}{B_2}}\right), \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \to \left(\frac{C_{00} c_{01} C_{02}}{\frac{c_{10}^T \gamma_{11} c_{12}^T}{C_{20} c_{21} C_{22}}}\right) $
	where $a_1$ has 1 row, $b_1$ has 1 row, $\gamma_{11}$ is 1 × 1
6	$\begin{pmatrix} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C_{00}} & \widehat{c_{01}} & \widehat{C_{02}} \\ \hline \widehat{c_{10}} & \widehat{\gamma_{11}} & \widehat{c_{12}}^T \\ \hline \widehat{C_{20}} & \widehat{c_{21}} & \widehat{C_{22}} \end{pmatrix}$
8	$c_{01} = A_0 \beta_1 + B_0 \alpha_1 + c_{01} c_{10}^T = c_{01}^T \gamma_{11} = \alpha_1^T \beta_1 + \beta_1^T \alpha_1 + \gamma_{11}$
5b	$ \left(\frac{A_{T}}{A_{B}}\right) \leftarrow \left(\frac{A_{0}}{a_{1}^{T}}\right), \left(\frac{B_{T}}{B_{B}}\right) \leftarrow \left(\frac{B_{0}}{b_{1}^{T}}\right), \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \leftarrow \left(\frac{C_{00} c_{01} C_{02}}{c_{10}^{T} \gamma_{11} c_{12}^{T}}\right) \\ \left(\frac{C_{00} c_{01} C_{02}}{A_{0}}\right) \leftarrow \left(\frac{A_{0} B_{0}^{T} + B_{0} A_{0}^{T} + \widehat{C}_{00} A_{0} \beta_{1} + B_{0} \alpha_{1} + \widehat{c}_{01}}{C_{02} c_{21} C_{22}}\right) $
7	$ \begin{pmatrix} A_B \\ \hline A_2 \end{pmatrix} \begin{pmatrix} B_B \\ \hline A_2 \end{pmatrix} \begin{pmatrix} C_{BL} \\ C_{BR} \end{pmatrix} \begin{pmatrix} C_{BL} \\ C_{BR} \end{pmatrix} \begin{pmatrix} C_{BL} \\ C_{20} \\ C_{21} \\ C_{22} \end{pmatrix} $ $ \begin{pmatrix} C_{00} \\ C_{01} \\ C_{02} \\ C_{21} \\ C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} \\ A_0 B_0^T + B_0 A_0^T + \widehat{C}_{10} \\ C_{10} \\ C_{10} \\ C_{21} \end{pmatrix} \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{10} \\ C_{11} \\ C_{22} \end{pmatrix} $ $ \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{10} \\ C_{11} \\ C_{22} \end{pmatrix} \begin{pmatrix} C_{01} \\ C_{02} \\ C_{11} \\ C_{22} \end{pmatrix} $
2	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} \right) $
	endwhile
2,3	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} \wedge \neg (m(A_T) < m(A)) $
1b	$[C] = \operatorname{syrk2}(A, B, \widehat{C})$

Algorithm:  $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$ 

$$A o \left(\frac{A_T}{A_B}\right) , B o \left(\frac{B_T}{B_B}\right) , C o \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right)$$

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

while  $m(A_T) < m(A)$  do

$$\left(\frac{A_T}{A_B}\right) \to \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \to \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \to \left(\frac{C_{00} c_{01} C_{02}}{\frac{c_{10}}{C_{10} c_{21} C_{22}}}\right)$$

where  $a_1$  has 1 row,  $b_1$  has 1 row,  $\gamma_{11}$  is  $1 \times 1$ 

$$c_{01} = A_0 \beta_1 + B_0 \alpha_1 + c_{01} c_{10}^T = c_{01}^T \gamma_{11} = \alpha_1^T \beta_1 + \beta_1^T \alpha_1 + \gamma_{11}$$

$$\left(\frac{A_T}{A_B}\right) \leftarrow \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \leftarrow \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL} | C_{TR}}{C_{BL} | C_{BR}}\right) \leftarrow \left(\frac{C_{00} | c_{01} | C_{02}}{c_{10}^T | \gamma_{11} | c_{12}^T}\right)$$

endwhile

Step	Algorithm: $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	
	whore
	where
2	
3	while do
2,3	$\wedge$
5a	
	•
	where
6	
8	
5b	
7	
·	
2	
	endwhile endwhile
0.0	
2,3	$\wedge \neg ( \hspace{1cm} )$
1b	$[C] = \operatorname{syrk2}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	
	where $\left(\begin{array}{cccccccccccccccccccccccccccccccccccc$
2	$ \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T  \widehat{C}_{TR}}{\widehat{C}_{BL}}  \widehat{C}_{BR}\right) $
3	while do
2,3	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BR} \end{vmatrix} \right) \wedge $
5a	
	where
6	
8	
5b	
7	
2	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} \right) $
	endwhile
2	$ \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T  \widehat{C}_{TR}}{\widehat{C}_{BL}}\right) \wedge \neg ( )  $
1b	$[C] = \operatorname{syrk2}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$
1a	$C = \hat{C}$
4	
2	where $ \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T \widehat{C}_{TR}}{\widehat{C}_{BL}}\right) $
3	while $m(A_T) < m(A)$ do
2,3	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}}   \widehat{C}_{TR} \right) \wedge m(A_T) < m(A) $
5a	
	where
6	
8	
5b	
7	
2	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} \right) $
	endwhile
2,3	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} \wedge \neg (m(A_T) < m(A)) $
1b	$[C] = \operatorname{syrk2}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A \rightarrow \begin{pmatrix} A_T \\ A_B \end{pmatrix}$ , $B \rightarrow \begin{pmatrix} B_T \\ B_B \end{pmatrix}$ , $C \rightarrow \begin{pmatrix} C_{TL} & C_{TR} \\ C_{BL} & C_{BR} \end{pmatrix}$ where $A_T$ has 0 rows, $B_T$ has 0 rows, $C_{TL}$ is $0 \times 0$
2	$ \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T \widehat{C}_{TR}}{\widehat{C}_{BL} \widehat{C}_{BR}}\right) $
3	while $m(A_T) < m(A)$ do
2,3	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BR} \end{vmatrix} \wedge m(A_T) < m(A) $
5a	
	where
6	
8	
5b	
7	
2	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} \right) $
	endwhile
2,3	$ \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T \widehat{C}_{TR}}{\widehat{C}_{BL} \widehat{C}_{BR}}\right) \wedge \neg (m(A_T) < m(A)) $
1b	$[C] = \operatorname{syrk2}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A \rightarrow \left(\frac{A_T}{A_B}\right), B \rightarrow \left(\frac{B_T}{B_B}\right), C \rightarrow \left(\frac{C_{TL}}{C_{BL}}\right)$ where $A_T$ has 0 rows, $B_T$ has 0 rows, $C_{TL}$ is $0 \times 0$
2	$ \left(\frac{C_{TL}   C_{TR}}{C_{BL}   C_{BR}}\right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T   \widehat{C}_{TR}}{\widehat{C}_{BL}   \widehat{C}_{BR}}\right) $
3	while $m(A_T) < m(A)$ do
2,3	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BR} \end{vmatrix} \wedge m(A_T) < m(A) $
5a	$ \begin{pmatrix} C_{TL} & C_{TR} \\ C_{BL} & C_{BR} \end{pmatrix} = \begin{pmatrix} \widehat{C}_{TL} + A_T B_T^T + B_T A_T^T   \widehat{C}_{TR} \\ \widehat{C}_{BL} & \widehat{C}_{BR} \end{pmatrix} \wedge m(A_T) < m(A) $ $ \begin{pmatrix} A_T \\ A_B \end{pmatrix} \to \begin{pmatrix} A_0 \\ \frac{a_1^T}{A_2} \end{pmatrix}, \begin{pmatrix} B_T \\ B_B \end{pmatrix} \to \begin{pmatrix} B_0 \\ \frac{b_1^T}{B_2} \end{pmatrix}, \begin{pmatrix} C_{TL}   C_{TR} \\ C_{BL}   C_{BR} \end{pmatrix} \to \begin{pmatrix} C_{00}   c_{01}   C_{02} \\ \frac{c_{10}^T}{c_{10}^T   c_{12}^T} \\ C_{20}   c_{21}   C_{22} \end{pmatrix} $ where $a_1$ has 1 row, $b_1$ has 1 row, $\gamma_{11}$ is 1 × 1
6	
8	
5b	$\left(\frac{A_T}{A_B}\right) \leftarrow \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \leftarrow \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL}   C_{TR}}{C_{BL}   C_{BR}}\right) \leftarrow \left(\frac{C_{00}   c_{01}   C_{02}}{c_{10}^T   \gamma_{11}   c_{12}^T}\right)$
7	
2	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T   \widehat{C}_{TR}}{\widehat{C}_{BL}} \right) $
	endwhile
2,3	$ \left(\frac{C_{TL}   C_{TR}}{C_{BL}   C_{BR}}\right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T   \widehat{C}_{TR}}{\widehat{C}_{BL}}\right) \wedge \neg (m(A_T) < m(A)) $
1b	$[C] = \operatorname{syrk2}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A  o \left(\frac{A_T}{A_B}\right), B  o \left(\frac{B_T}{B_B}\right), C  o \left(\frac{C_{TL}}{C_{BL}}\right)$ where $A_T$ has 0 rows, $B_T$ has 0 rows, $C_{TL}$ is $0  imes 0$
2	$ \left(\frac{C_{TL}   C_{TR}}{C_{BL}   C_{BR}}\right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T   \widehat{C}_{TR}}{\widehat{C}_{BL}   \widehat{C}_{BR}}\right) $
3	while $m(A_T) < m(A)$ do
2,3	$ \left(\frac{C_{TL}   C_{TR}}{C_{BL}   C_{BR}}\right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T   \widehat{C}_{TR}}{\widehat{C}_{BL}   \widehat{C}_{BR}}\right) \wedge m(A_T) < m(A) $
5a	$ \left(\frac{A_T}{A_B}\right) \to \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \to \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL}}{C_{BL}}\right) \to \left(\frac{C_{00}}{c_{01}}\right) \to \left$
6	$ \begin{pmatrix} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & \widehat{c}_{01} & \widehat{C}_{02} \\ \hline \widehat{c}_{10}^T & \widehat{c}_{11}^T & \widehat{c}_{12}^T \\ \hline \widehat{C}_{20} & \widehat{c}_{21} & \widehat{C}_{22} \end{pmatrix} $
8	
5b	$\left(\frac{A_T}{A_B}\right) \leftarrow \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \leftarrow \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL}   C_{TR}}{C_{BL}   C_{BR}}\right) \leftarrow \left(\frac{C_{00}   c_{01}   C_{02}}{c_{10}^T   \gamma_{11}   c_{12}^T}\right)$
7	
2	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} \right) $
	endwhile
2,3	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} \right) \land \neg (m(A_T) < m(A)) $
1b	$[C] = \operatorname{syrk2}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A  o \left(\frac{A_T}{A_B}\right), B  o \left(\frac{B_T}{B_B}\right), C  o \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right)$
2	where $A_T$ has 0 rows, $B_T$ has 0 rows, $C_{TL}$ is $0 \times 0$ $ \left(\begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right) = \left(\begin{array}{c c} \widehat{C}_{TL} + A_T B_T^T + B_T A_T^T   \widehat{C}_{TR} \\ \hline \widehat{C}_{BL} & \widehat{C}_{BR} \end{array}\right) $
3	while $m(A_T) < m(A)$ do
2,3	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T   \widehat{C}_{TR}}{\widehat{C}_{BL}} \right) \wedge m(A_T) < m(A) $
5a	$ \left(\frac{A_T}{A_B}\right) \to \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \to \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \to \left(\frac{C_{00} c_{01} C_{02}}{c_{10}^T \gamma_{11} c_{12}^T}\right) $
6	where $a_1$ has 1 row, $b_1$ has 1 row, $\gamma_{11}$ is $1 \times 1$ $ \begin{pmatrix} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & \widehat{c}_{01} & \widehat{C}_{02} \\ \hline \widehat{c}_{10}^T & \widehat{\gamma}_{11} & \widehat{c}_{12}^T \\ \hline \widehat{C}_{20} & \widehat{c}_{21} & \widehat{C}_{22} \end{pmatrix} $
8	
5b	$ \left(\frac{A_T}{A_B}\right) \leftarrow \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \leftarrow \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \leftarrow \left(\frac{C_{00} c_{01} C_{02}}{c_{10}^T \gamma_{11} c_{12}^T}\right) \\ \frac{C_{TL} C_{TR}}{C_{DL} C_{DR}}\right) \leftarrow \left(\frac{C_{00} c_{01} C_{02}}{c_{10}^T \gamma_{11} c_{12}^T}\right) \\ \frac{C_{DL} C_{DR}}{C_{DL} C_{DR}}\right) \leftarrow \left(\frac{C_{DL} C_{DR}}{c_{10} c_{11} c_{12}}\right) \\ \frac{C_{DL} C_{DR}}{C_{DR} c_{11} c_{12}} + c_{12} c_$
7	$ \begin{pmatrix} A_{T} \\ A_{B} \end{pmatrix} \leftarrow \begin{pmatrix} A_{0} \\ a_{1}^{T} \\ A_{2} \end{pmatrix}, \begin{pmatrix} B_{T} \\ B_{B} \end{pmatrix} \leftarrow \begin{pmatrix} \frac{B_{0}}{b_{1}^{T}} \\ B_{B} \end{pmatrix}, \begin{pmatrix} C_{TL} C_{TR} \\ C_{BL} C_{BR} \end{pmatrix} \leftarrow \begin{pmatrix} \frac{C_{00} c_{01} C_{02}}{c_{10}^{T} \gamma_{11} c_{12}^{T}} \\ C_{20} c_{21} C_{22} \end{pmatrix} $ $ \begin{pmatrix} C_{00} c_{01} C_{02} \\ c_{10}^{T} \gamma_{11} c_{12}^{T} \\ C_{20} c_{21} C_{22} \end{pmatrix} = \begin{pmatrix} A_{0} B_{0}^{T} + B_{0} A_{0}^{T} + \widehat{C}_{00} A_{0} \beta_{1} + B_{0} \alpha_{1} + \widehat{c}_{01} \widehat{C}_{02} \\ \alpha_{1}^{T} B_{0}^{T} + \beta_{1}^{T} A_{0}^{T} + \widehat{c}_{10}^{T} \alpha_{1}^{T} \beta_{1} + \beta_{1}^{T} \alpha_{1} + \widehat{\gamma}_{11} \widehat{c}_{12}^{T} \\ \widehat{C}_{20} \widehat{C}_{21} \widehat{C}_{22} \end{pmatrix} $
2	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} \right) $
	endwhile
2	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} \wedge \neg (m(A_T) < m(A)) $
1b	$[C] = \operatorname{syrk2}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$
1a	$C = \widehat{C}$
4	$A  o \left(\frac{A_T}{A_B}\right)$ , $B  o \left(\frac{B_T}{B_B}\right)$ , $C  o \left(\frac{C_{TL}}{C_{BL}}\right)$ where $A_T$ has 0 rows, $B_T$ has 0 rows, $C_{TL}$ is $0  imes 0$
2	$ \left(\frac{C_{TL}   C_{TR}}{C_{BL}   C_{BR}}\right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T   \widehat{C}_{TR}}{\widehat{C}_{BL}   \widehat{C}_{BR}}\right) $
3	while $m(A_T) < m(A)$ do
2,3	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BR} \end{vmatrix} \wedge m(A_T) < m(A) $
5a	$ \left(\frac{A_T}{A_B}\right) \to \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \to \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \to \left(\frac{C_{00} c_{01} C_{02}}{c_{10}^T \gamma_{11} c_{12}^T}\right) $
	where $a_1$ has 1 row, $b_1$ has 1 row, $\gamma_{11}$ is $1 \times 1$
6	$ \frac{\left(\frac{C_{00}  c_{01}  C_{02}}{c_{10}^T  c_{11}  c_{12}^T}\right)}{\left(\frac{C_{20}  c_{21}  C_{22}}{c_{21}  C_{22}}\right)} = \frac{\left(\frac{A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00}  \widehat{c}_{01}  \widehat{C}_{02}}{\widehat{c}_{10}^T  \widehat{c}_{12}^T} \right)}{\widehat{C}_{20}  \widehat{c}_{21}  \widehat{C}_{22}} = \frac{\left(\frac{A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00}  \widehat{c}_{01}  \widehat{C}_{02}}{\widehat{c}_{10}^T  \widehat{c}_{12}^T} \right)}{\widehat{C}_{20}  \widehat{c}_{21}  \widehat{C}_{22}} $
8	$c_{01} = A_0 \beta_1 + B_0 \alpha_1 + c_{01} c_{10}^T = c_{01}^T \gamma_{11} = \alpha_1^T \beta_1 + \beta_1^T \alpha_1 + \gamma_{11}$
5b	$ \left(\frac{A_T}{A_B}\right) \leftarrow \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \leftarrow \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \leftarrow \left(\frac{C_{00} c_{01} C_{02}}{c_{10}^T \gamma_{11} c_{12}^T}\right) \\ \left(\frac{C_{00} c_{01} C_{02}}{A_0 \beta_1}\right) \leftarrow \left(\frac{A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00}}{A_0 \beta_1}\right) \leftarrow \left(\frac{C_{00} c_{01} C_{02}}{c_{10}^T \gamma_{11} c_{12}^T}\right) \\ \left(\frac{C_{00} c_{01} C_{02}}{A_0 \beta_1}\right) \leftarrow \left(\frac{A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00}}{A_0 \beta_1}\right) \leftarrow \left(\frac{C_{00} c_{01} C_{02}}{c_{10} c_{21} C_{22}}\right) $
7	$ \begin{pmatrix} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{pmatrix} = \begin{pmatrix} A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00} & A_0 \beta_1 + B_0 \alpha_1 + \widehat{c}_{01} & \widehat{C}_{02} \\ \hline \alpha_1^T B_0^T + \beta_1^T A_0^T + \widehat{c}_{10}^T & \alpha_1^T \beta_1 + \beta_1^T \alpha_1 + \widehat{\gamma}_{11} & \widehat{c}_{12}^T \\ \hline \widehat{C}_{20} & \widehat{c}_{21} & \widehat{C}_{22} \end{pmatrix} $
2	$ \left(\frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} \right) $
	endwhile
2,3	$ \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) = \left(\frac{\widehat{C}_{TL} + A_T B_T^T + B_T A_T^T  \widehat{C}_{TR}}{\widehat{C}_{BL}}\right) \wedge \neg (m(A_T) < m(A)) $
1b	$[C] = \operatorname{syrk2}(A, B, \widehat{C})$

Step	Algorithm: $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$
	$A \to \begin{pmatrix} A_T \\ A_B \end{pmatrix}, B \to \begin{pmatrix} B_T \\ B_B \end{pmatrix}, C \to \begin{pmatrix} C_{TL} & C_{TR} \\ C_{BL} & C_{BR} \end{pmatrix}$ where $A_T$ has 0 rows, $B_T$ has 0 rows, $C_{TL}$ is $0 \times 0$
	while $m(A_T) < m(A)$ do
	$ \left(\frac{A_{T}}{A_{B}}\right) \to \left(\frac{A_{0}}{a_{1}^{T}}\right), \left(\frac{B_{T}}{B_{B}}\right) \to \left(\frac{B_{0}}{b_{1}^{T}}\right), \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \to \left(\frac{C_{00} c_{01} C_{02}}{c_{10}^{T} \gamma_{11} c_{12}^{T}}\right) $ where $a_{1}$ has 1 row, $b_{1}$ has 1 row, $\gamma_{11}$ is 1 × 1
	$c_{01} = A_0 \beta_1 + B_0 \alpha_1 + c_{01} c_{10}^T = c_{01}^T \gamma_{11} = \alpha_1^T \beta_1 + \beta_1^T \alpha_1 + \gamma_{11}$
	$ \left(\frac{A_T}{A_B}\right) \leftarrow \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \leftarrow \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL}   C_{TR}}{C_{BL}   C_{BR}}\right) \leftarrow \left(\frac{C_{00}   c_{01}   C_{02}}{c_{10}^T   \gamma_{11}   c_{12}^T}\right) \\ \frac{C_{TL}   C_{TR}   C_{TR}}{C_{DL}   C_{DR}}\right) \leftarrow \left(\frac{C_{00}   c_{01}   C_{02}}{c_{10}^T   \gamma_{11}   c_{12}^T}\right) \\ \frac{C_{DL}   c_{DR}   c_{DR}}{C_{DR}   c_{DR}}\right) \leftarrow \left(\frac{C_{DL}   c_{DR}}{C_{DR}}\right) \leftarrow \left(\frac{C_{DR}   c_{DR$
	endwhile

Algorithm:  $[C] := \text{SYRK2\_UNB\_VAR1}(A, B, C)$ 

$$A o \left(\frac{A_T}{A_B}\right), B o \left(\frac{B_T}{B_B}\right), C o \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right)$$

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

while  $m(A_T) < m(A)$  do

$$\left(\frac{A_T}{A_B}\right) \to \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \to \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \to \left(\frac{C_{00} c_{01} C_{02}}{c_{10}^T \gamma_{11} c_{12}^T}\right)$$

where  $a_1$  has 1 row,  $b_1$  has 1 row,  $\gamma_{11}$  is  $1 \times 1$ 

$$c_{01} = A_0 \beta_1 + B_0 \alpha_1 + c_{01} c_{10}^T = c_{01}^T \gamma_{11} = \alpha_1^T \beta_1 + \beta_1^T \alpha_1 + \gamma_{11}$$

$$\left(\frac{A_T}{A_B}\right) \leftarrow \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \leftarrow \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL} | C_{TR}}{C_{BL} | C_{BR}}\right) \leftarrow \left(\frac{C_{00} | c_{01} | C_{02}}{c_{10}^T | \gamma_{11} | c_{12}^T}\right)$$

endwhile