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	$A \rightarrow \begin{pmatrix} A_T \\ A_B \end{pmatrix}$, $B \rightarrow \begin{pmatrix} B_T \\ B_B \end{pmatrix}$, $C \rightarrow \begin{pmatrix} C_{TL} & C_{TR} \\ C_{BL} & C_{BR} \end{pmatrix}$ where A_T has 0 rows, B_T has 0 rows, C_{TL} is 0×0
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) $
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}_{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) \\ \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \to \left(\frac{C_{00} c_{01} C_{02}}{c_{10} c_{11} c_{12}^T}\right) $
6	$ \frac{\text{where}}{\left(\frac{C_{00}}{c_{01}} \begin{vmatrix} c_{02} \\ c_{01} \end{vmatrix} c_{01} \begin{vmatrix} c_{02} \\ c_{10} \end{vmatrix} \right)} = \left(\frac{A_0 B_0^T + B_0 A_0^T + \widehat{C}_{00}}{\widehat{c}_{10}} \begin{vmatrix} \widehat{c}_{01} \\ \widehat{C}_{02} \end{vmatrix} + \widehat{C}_{10}}{\widehat{C}_{20}} \begin{vmatrix} \widehat{c}_{01} \\ \widehat{C}_{10} \end{vmatrix} \widehat{C}_{11}} \begin{vmatrix} \widehat{c}_{02} \\ \widehat{C}_{21} \end{vmatrix} + \widehat{C}_{12} \begin{vmatrix} \widehat{c}_{01} \\ \widehat{C}_{22} \end{vmatrix} + \widehat{C}_{12} \begin{vmatrix} \widehat{c}_{01} \\ \widehat{C}_{12} \end{vmatrix} + \widehat{C}_{1$
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) \\ \frac{C_{TL} C_{TR}}{C_{DL} C_{DR}}\right) \leftarrow \left(\frac{C_{00} c_{01} C_{02}}{c_{10} \gamma_{11} c_{12}^T}\right) \\ \frac{C_{DL} C_{DR}}{C_{DL} C_{DR}}\right) \leftarrow \left(\frac{C_{DL} c_{11} c_{12}}{c_{12} 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}_{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	$[C] = \operatorname{syrk2}(A, B, \widehat{C})$

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 0×0

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, γ_{11} is 1×1

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

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

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 0×0
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 0×0
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, γ_{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 0×0 $ \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} = \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 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, γ_{11} is 1×1 $ \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	$A o \left(\frac{A_T}{A_B}\right), B o \left(\frac{B_T}{B_B}\right), C o \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right)$ 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}} \widehat{C}_{TR} \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) \\ \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \to \left(\frac{C_{00} c_{01} C_{02}}{c_{10} c_{11} c_{12}^T}\right) \\ \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \to \left(\frac{C_{00} c_{01} C_{02}}{c_{10} c_{11} c_{12}^T}\right) \\ \left(\frac{C_{TL} C_{TR} c_{11} c_{12}^T}{C_{20} c_{21} c_{22}}\right) $
6	where a_1 has 1 row, b_1 has 1 row, γ_{11} is 1×1 $ \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	$c_{01} = A_0 \beta_1 + B_0 \alpha_1 + c_{01}$ $c_{10}^T = c_{01}^T$ $\gamma_{11} = \alpha_1^T \beta_1 + \beta_1^T \alpha_1 + \gamma_{11}$
5b	$\left(\frac{A_T}{A_B}\right) \leftarrow \left(\frac{A_0}{a_1^T}\right), \left(\frac{B_T}{B_B}\right) \leftarrow \left(\frac{B_0}{b_1^T}\right), \left(\frac{C_{TL} C_{TR}}{C_{BL} C_{BR}}\right) \leftarrow \left(\frac{C_{00} c_{01} C_{02}}{c_{10}^T \gamma_{11} c_{12}^T}\right)$
7	$ \begin{pmatrix} \frac{C_{00} c_{01} C_{02}}{c_{10}^T \gamma_{11} c_{12}^T} \\ \frac{C_{20} c_{21} C_{22} \end{pmatrix} = \begin{pmatrix} \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} \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}_{20} \widehat{C}_{21} \widehat{C}_{22} \end{pmatrix} $
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) $
	endwhile
2,3	$\left \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)) \right $
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 0×0
	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, γ_{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_{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_{11} C_{DR}}{c_{11} c_{12}}\right) + C_{DR} c_{DR} c_{DR} c_{DR} c_{DR} $
	endwhile

 $\textbf{Algorithm:} \ [C] := \texttt{SYRK2_UNB_VAR1}(A, B, C)$

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

where A_T has 0 rows, B_T has 0 rows, C_{TL} is 0×0

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, γ_{11} is 1×1

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

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

endwhile