Step	Algorithm: $[C] := \text{SYRK\_AC\_UNB\_VAR3}(A, C)$
1a	$\{C = \widehat{C}\}$
4	$A \to \left( \begin{array}{c c} A_L & A_R \end{array} \right), C \to \left( \begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array} \right)$ where $A_R$ has 0 columns, $C_{BR}$ is $0 \times 0$
2	$ \left\{ \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} A_R^T A_R + \widehat{C}_{BR} \right) \right\} $
3	while $n(A_R) < n(A)$ do
2,3	$\left\{ \left( \begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array} \right) = \left( \begin{array}{c c} \widehat{C}_{TL} & \widehat{C}_{TR} \\ \hline \widehat{C}_{BL} & A_R^T A_R + \widehat{C}_{BR} \end{array} \right) \wedge n(A_R) < n(A) \right\}$
5a	$\left(\begin{array}{c c} A_L & A_R \end{array}\right) \to \left(\begin{array}{c c} A_0 & a_1 & A_2 \end{array}\right) , \left(\begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right) \to \left(\begin{array}{c c} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{array}\right)$
	where $a_1$ has 1 column, $\gamma_{11}$ is $1 \times 1$
6	$\left\{ \begin{array}{c c c} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{array} \right) = \begin{pmatrix} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & A_2^T A_2 + \widehat{C}_{22} \end{pmatrix}$
8	$c_{12}^{T} = a_{1}^{T} A 2 + c_{12}^{T}$ $\gamma_{11} = a_{1}^{T} a 1 + \gamma_{11}$
7	$ \left\{ \begin{array}{c cccc} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ C_{20} & c_{21} & C_{22} \end{array} \right) = \left( \begin{array}{c cccc} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & a_1^T a 1 + \widehat{\gamma}_{11} & a_1^T A 2 + \widehat{c}_{12}^T \\ C_{20} & c_{21} & A_2^T A_2 + \widehat{C}_{22} \end{array} \right) $
5b	$ \left( A_{L} \middle  A_{R} \right) \leftarrow \left( A_{0} \middle  a_{1} \middle  A_{2} \right), \left( \frac{C_{TL}}{C_{BL}} \middle  C_{TR} \right) \leftarrow \left( \frac{C_{00}}{c_{01}} \middle  C_{02} \right) \\ \left( C_{00} \middle  c_{01} \middle  C_{02} \right) \\ \left( C_{20} \middle  c_{21} \middle  C_{22} \right) $
2	$\left\{ \begin{array}{c c} \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} C_{BR} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} A_R^T A_R + \widehat{C}_{BR} \right) \right\}$
	endwhile
2,3	$\left\{ \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} A_R^T A_R + \widehat{C}_{BR} \right) \land \neg (n(A_R) < n(A)) $
1b	$\{[C] = \operatorname{syrk\_ac}(A, \widehat{C})$

Step	Algorithm: $[C] := \text{SYRK\_AC\_UNB\_VAR3}(A, C)$
1a	{
4	where
2	
3	while do
2,3	
5a	where
6	
8	
7	
5b	
2	
	endwhile
2,3	$\left  \left\{ \begin{array}{c} \\ \\ \end{array} \right. \right. $
1b	{

Step	Algorithm: $[C] := \text{SYRK\_AC\_UNB\_VAR3}(A, C)$
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}{ccc} & & & \\ & & & \\ & & & \\ \end{array} \right. $
1b	$\left\{ [C] = \operatorname{syrk\_ac}(A, \widehat{C}) \right\}$

Step	Algorithm: $[C] := \text{SYRK\_AC\_UNB\_VAR3}(A, C)$
1a	${C = \widehat{C}}$
4	where
2	$\left\{ \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} A_R^T A_R + \widehat{C}_{BR} \right) \right\}$
3	while do
2,3	$\left\{ \begin{array}{c c} \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} A_R^T A_R + \widehat{C}_{BR} \right) \wedge \right.$
5a	where
6	
8	
7	
5b	
2	$\left\{ \begin{array}{c c} \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} C_{BR} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} A_R^T A_R + \widehat{C}_{BR} \right) \right\}$
	endwhile
2,3	$ \left\{ \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} A_R^T A_R + \widehat{C}_{BR} \right) \land \neg ( )  \right\} $
1b	$\{[C] = \operatorname{syrk\_ac}(A, \widehat{C})$ }

Step	Algorithm: $[C] := \text{SYRK\_AC\_UNB\_VAR3}(A, C)$
1a	${C = \widehat{C}}$
4	where
2	$\left\{ \left( \frac{C_{TL}}{C_{BL}} \left  \frac{C_{TR}}{C_{BR}} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \left  \frac{\widehat{C}_{TR}}{\widehat{C}_{BL}} \right  A_R^T A_R + \widehat{C}_{BR} \right) \right\}$
3	while $n(A_R) < n(A)$ do
2,3	$\left\{ \begin{array}{c c} \left( \frac{C_{TL}}{C_{BL}} \middle  C_{TR} \\ C_{BL} \middle  C_{BR} \end{array} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \middle  \frac{\widehat{C}_{TR}}{\widehat{C}_{BL}} \middle  A_R^T A_R + \widehat{C}_{BR} \right) \wedge n(A_R) < n(A) \end{array} \right\}$
5a	
	where
6	
8	
7	
5b	
2	$ \left\{ \begin{array}{c c} \left( \frac{C_{TL}}{C_{BL}} \middle  C_{TR} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \middle  \frac{\widehat{C}_{TR}}{\widehat{C}_{BL}} \middle  A_R^T A_R + \widehat{C}_{BR} \right) \right\} $
	endwhile
2,3	$\left\{ \left( \frac{C_{TL}}{C_{BL}} \left  \frac{C_{TR}}{C_{BR}} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \left  \frac{\widehat{C}_{TR}}{\widehat{C}_{BL}} \right  \wedge \neg (n(A_R) < n(A)) \right. \right\}$
1b	$\{ [C] = \operatorname{syrk\_ac}(A, \widehat{C}) $ }

Step	Algorithm: $[C] := \text{SYRK\_AC\_UNB\_VAR3}(A, C)$
1a	$\{C = \widehat{C}$
4	$\{C = \widehat{C} \}$ $A \to \left( A_L \middle  A_R \right), C \to \left( \frac{C_{TL}}{C_{BL}} \middle  C_{TR} \right)$ where $A_R$ has 0 columns, $C_{BR}$ is $0 \times 0$
2	$ \begin{cases} \begin{pmatrix} C_{TL} & C_{TR} \\ C_{BL} & C_{BR} \end{pmatrix} = \begin{pmatrix} \hat{C}_{TL} & \hat{C}_{TR} \\ \hat{C}_{BL} & \hat{C}_{BR} \end{pmatrix} $
3	while $n(A_R) < n(A)$ do
2,3	$\left\{ \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} A_R^T A_R + \widehat{C}_{BR} \right) \land n(A_R) < n(A) $
5a	where
	where
6	
8	
7	
5b	
2	$ \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} & \widehat{C}_{TR} \\ \hline \widehat{C}_{BL} & A_R^T A_R + \widehat{C}_{BR} \end{array} \right) $
	endwhile
2,3	$\left\{ \left( \frac{C_{TL}}{C_{BL}} \middle  C_{TR} \atop C_{BR} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \middle  \widehat{C}_{TR} \atop \widehat{C}_{BL} \middle  A_R^T A_R + \widehat{C}_{BR} \right) \land \neg (n(A_R) < n(A)) \right\}$
1b	$\left\{ [C] = \operatorname{syrk\_ac}(A, \widehat{C}) \right\}$

Step	Algorithm: $[C] := \text{SYRK\_AC\_UNB\_VAR3}(A, C)$
1a	$\{C = \widehat{C}$
4	$A  o \left( A_L \middle  A_R \right), C  o \left( \frac{C_{TL} \middle  C_{TR}}{C_{BL} \middle  C_{BR}} \right)$ where $A_R$ has 0 columns, $C_{BR}$ is $0  imes 0$
2	$ \left\{ \left( \frac{C_{TL}}{C_{BL}} \left  \frac{C_{TR}}{C_{BR}} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \left  \frac{\widehat{C}_{TR}}{\widehat{C}_{BR}} \right) \right. \right\} $
3	while $n(A_R) < n(A)$ do
2,3	$ \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} & \widehat{C}_{TR} \\ \hline \widehat{C}_{BL} & A_R^T A_R + \widehat{C}_{BR} \end{array} \right) \wedge n(A_R) < n(A) $
5a	$\begin{pmatrix} A_L \mid A_R \end{pmatrix} \rightarrow \begin{pmatrix} A_0 \mid a_1 \mid A_2 \end{pmatrix}, \begin{pmatrix} C_{TL} \mid C_{TR} \\ C_{BL} \mid C_{BR} \end{pmatrix} \rightarrow \begin{pmatrix} C_{00} \mid c_{01} \mid C_{02} \\ c_{10}^T \mid \gamma_{11} \mid c_{12}^T \\ \hline C_{20} \mid c_{21} \mid C_{22} \end{pmatrix}$ where $a_1$ has 1 column, $\gamma_{11}$ is $1 \times 1$
6	
8	
7	
5b	$\left(\begin{array}{c c} A_L & A_R \end{array}\right) \leftarrow \left(\begin{array}{c c} A_0 & a_1 & A_2 \end{array}\right), \left(\begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c c} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{array}\right)$
2	$ \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} & \widehat{C}_{TR} \\ \hline \widehat{C}_{BL} & A_R^T A_R + \widehat{C}_{BR} \end{array} \right) $
	endwhile
2,3	$ \left\{ \left( \frac{C_{TL}}{C_{BL}} \middle  C_{TR} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \middle  \frac{\widehat{C}_{TR}}{\widehat{C}_{BL}} \middle  A_R^T A_R + \widehat{C}_{BR} \right) \land \neg (n(A_R) < n(A)) \right\} $
1b	$\{[C] = \operatorname{syrk\_ac}(A, \widehat{C})$

Step	Algorithm: $[C] := \text{SYRK\_AC\_UNB\_VAR3}(A, C)$	
1a	$\{C=\widehat{C}$	}
4	$A  o \left( \begin{array}{c c} A_L & A_R \end{array} \right), C  o \left( \begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array} \right)$ where $A_R$ has 0 columns, $C_{BR}$ is $0  imes 0$	
2	$ \left\{ \left( \frac{C_{TL}}{C_{BL}} \left  \frac{C_{TR}}{C_{BR}} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \left  \frac{\widehat{C}_{TR}}{\widehat{C}_{BR}} \right) \right. \right. $	
3	while $n(A_R) < n(A)$ do	
2,3	$\left\{ \begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array} \right\} = \left( \begin{array}{c c} \widehat{C}_{TL} & \widehat{C}_{TR} \\ \hline \widehat{C}_{BL} & A_R^T A_R + \widehat{C}_{BR} \end{array} \right) \wedge n(A_R) < n(A)$	$\bigg\}$
5a	$ \left( \begin{array}{c c} A_L & A_R \end{array} \right) \to \left( \begin{array}{c c} A_0 & A_1 & A_2 \end{array} \right) , \left( \begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array} \right) \to \left( \begin{array}{c c} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{array} \right) $	
6	$ \begin{cases}                                    $	
8		
7		
5b	$ \left( \begin{array}{c c} A_L & A_R \end{array} \right) \leftarrow \left( \begin{array}{c c} A_0 & a_1 & A_2 \end{array} \right) , \left( \begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array} \right) \leftarrow \left( \begin{array}{c c} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{array} \right) $	
2	$ \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} & \widehat{C}_{TR} \\ \hline \widehat{C}_{BL} & A_R^T A_R + \widehat{C}_{BR} \end{array} \right) $	$\left. \right\}$
	endwhile	
2,3	$\left\{ \left( \frac{C_{TL}}{C_{BL}} \middle  C_{TR} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \middle  \frac{\widehat{C}_{TR}}{\widehat{C}_{BL}} \middle  A_R^T A_R + \widehat{C}_{BR} \right) \land \neg (n(A_R) < n(A)) \right\}$	$\left. \right\}$
1b	$\{[C] = \operatorname{syrk\_ac}(A, \widehat{C})$	}

Step	Algorithm: $[C] := \text{SYRK\_AC\_UNB\_VAR3}(A, C)$
1a	${C = \widehat{C}}$
4	$A \to \begin{pmatrix} A_L & A_R \end{pmatrix}, C \to \begin{pmatrix} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{pmatrix}$ where $A_R$ has 0 columns, $C_{BR}$ is $0 \times 0$
2	$ \left\{ \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} A_R^T A_R + \widehat{C}_{BR} \right) \right\} $
3	while $n(A_R) < n(A)$ do
2,3	$\left\{ \left( \frac{C_{TL}}{C_{BL}} \middle  C_{TR} \atop C_{BL} \middle  C_{BR} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \middle  \frac{\widehat{C}_{TR}}{\widehat{C}_{RR}} \right) \wedge n(A_R) < n(A) \right\}$
5a	$\left(\begin{array}{c c}A_L & A_R\end{array}\right) \rightarrow \left(\begin{array}{c c}A_0 & a_1 & A_2\end{array}\right), \left(\begin{array}{c c}C_{TL} & C_{TR} \\\hline C_{BL} & C_{BR}\end{array}\right) \rightarrow \left(\begin{array}{c c}C_{00} & c_{01} & C_{02} \\\hline c_{10}^T & \gamma_{11} & c_{12}^T \\\hline C_{20} & c_{21} & C_{22}\end{array}\right)$
6	$ \begin{cases}                                    $
8	(
7	$ \left\{ \begin{array}{c cccc} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ C_{20} & c_{21} & C_{22} \end{array} \right) = \left( \begin{array}{c cccc} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & a_1^T a 1 + \widehat{\gamma}_{11} & a_1^T A 2 + \widehat{c}_{12}^T \\ C_{20} & c_{21} & A_2^T A_2 + \widehat{C}_{22} \end{array} \right) $
5b	$ \left( \begin{array}{c c} A_L & A_R \end{array} \right) \leftarrow \left( \begin{array}{c c} A_0 & a_1 & A_2 \end{array} \right) , \left( \begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array} \right) \leftarrow \left( \begin{array}{c c} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{array} \right) $
2	$ \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} & \widehat{C}_{TR} \\ \hline \widehat{C}_{BL} & A_R^T A_R + \widehat{C}_{BR} \end{array} \right) $
	endwhile
2,3	$ \left\{ \left( \frac{C_{TL}}{C_{BL}} \middle  C_{TR} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \middle  \frac{\widehat{C}_{TR}}{\widehat{C}_{BL}} \middle  A_R^T A_R + \widehat{C}_{BR} \right) \land \neg (n(A_R) < n(A)) \right\} $
1b	$\{[C] = \operatorname{syrk\_ac}(A, \widehat{C})$

Step	Algorithm: $[C] := \text{SYRK\_AC\_UNB\_VAR3}(A, C)$
1a	$\{C = \widehat{C}$
4	$A  o \left( A_L \middle  A_R \right), C  o \left( \frac{C_{TL}}{C_{BL}} \middle  C_{TR} \right)$
2	where $A_R$ has 0 columns, $C_{BR}$ is $0 \times 0$ $ \left\{ \begin{pmatrix} C_{TL} & C_{TR} \\ C_{BL} & C_{BR} \end{pmatrix} = \begin{pmatrix} \widehat{C}_{TL} & \widehat{C}_{TR} \\ \widehat{C}_{BL} & A_R^T A_R + \widehat{C}_{BR} \end{pmatrix} \right. $
3	while $n(A_R) < n(A)$ do
2,3	$\left\{ \begin{array}{c c} \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} A_R^T A_R + \widehat{C}_{BR} \right) \wedge n(A_R) < n(A) \end{array} \right\}$
5a	$ \left( \begin{array}{c c} A_L & A_R \end{array} \right) \to \left( \begin{array}{c c} A_0 & A_1 & A_2 \end{array} \right) , \left( \begin{array}{c c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array} \right) \to \left( \begin{array}{c c} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{array} \right) $
	where $a_1$ has 1 column, $\gamma_{11}$ is $1 \times 1$
6	$\left\{ \begin{array}{c cccc} C_{00} & c_{01} & C_{02} \\ c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{array} \right) = \begin{pmatrix} C_{00} & c_{01} & C_{02} \\ c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & A_2^T A_2 + \widehat{C}_{22} \end{pmatrix}$
8	$c_{12}^{T} = a_{1}^{T} A 2 + c_{12}^{T}$ $\gamma_{11} = a_{1}^{T} a 1 + \gamma_{11}$
7	$ \left\{ \begin{array}{c cccc} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ C_{20} & c_{21} & C_{22} \end{array} \right) = \left( \begin{array}{c cccc} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & a_1^T a 1 + \widehat{\gamma}_{11} & a_1^T A 2 + \widehat{c}_{12}^T \\ C_{20} & c_{21} & A_2^T A_2 + \widehat{C}_{22} \end{array} \right) $
5b	$\left( \begin{array}{c c} C_{00} & C_{01} & C_{02} \end{array} \right)$
2	$ \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} & \widehat{C}_{TR} \\ \hline \widehat{C}_{BL} & A_R^T A_R + \widehat{C}_{BR} \end{array} \right) $
	endwhile
2,3	$\left\{ \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BL} \end{vmatrix} \right) = \left( \frac{\widehat{C}_{TL}}{\widehat{C}_{BL}} \begin{vmatrix} \widehat{C}_{TR} \\ \widehat{C}_{BL} \end{vmatrix} A_R^T A_R + \widehat{C}_{BR} \right) \land \neg (n(A_R) < n(A)) $
1b	$\left\{ [C] = \operatorname{syrk\_ac}(A, \widehat{C}) \right\}$

Algorithm:	$[C] := \text{SYRK\_AC\_UNB\_VAR3}(A, C)$
	$A_R$ ), $C  o \left( \frac{C_{TL}}{C_{BL}} \begin{vmatrix} C_{TR} \\ C_{BR} \end{vmatrix} \right)$ $A_R$ has 0 columns, $C_{BR}$ is $0 \times 0$
while $n(A_I)$	$n(A)  ext{ do}$
	$(A_{R}) \rightarrow (A_{0}   a_{1}   A_{2}), (\frac{C_{TL}   C_{TR}}{C_{BL}   C_{BR}}) \rightarrow (\frac{C_{00}   c_{01}   C_{02}}{c_{10}^{T}   \gamma_{11}   c_{12}^{T}})$ The $a_{1}$ has 1 column, $\gamma_{11}$ is $1 \times 1$
12	$a_1^T A 2 + c_{12}^T$ $a_1^T a 1 + \gamma_{11}$
$\left( A_{L}\right) .$	$(A_R) \leftarrow (A_0   a_1   A_2), \left(\frac{C_{TL}   C_{TR}}{C_{BL}   C_{BR}}\right) \leftarrow \left(\frac{C_{00}   c_{01}   C_{02}}{c_{10}^T   \gamma_{11}   c_{12}^T}\right)$
endwhile	

Algorithm:  $[C] := SYRK\_AC\_UNB\_VAR3(A, C)$ 

$$A \to \left( A_L \mid A_R \right), C \to \left( \frac{C_{TL} \mid C_{TR}}{C_{BL} \mid C_{BR}} \right)$$

where  $A_R$  has 0 columns,  $C_{BR}$  is  $0 \times 0$ 

while  $n(A_R) < n(A)$  do

$$\left( \begin{array}{c|c} A_L & A_R \end{array} \right) \to \left( \begin{array}{c|c} A_0 & A_1 & A_2 \end{array} \right) , \left( \begin{array}{c|c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array} \right) \to \left( \begin{array}{c|c} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{array} \right)$$

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

$$c_{12}^T = a_1^T A 2 + c_{12}^T$$

$$\gamma_{11} = a_1^T a \mathbf{1} + \gamma_{11}$$

$$\left(\begin{array}{c|c} A_L & A_R \end{array}\right) \leftarrow \left(\begin{array}{c|c} A_0 & a_1 & A_2 \end{array}\right), \left(\begin{array}{c|c} C_{TL} & C_{TR} \\ \hline C_{BL} & C_{BR} \end{array}\right) \leftarrow \left(\begin{array}{c|c} C_{00} & c_{01} & C_{02} \\ \hline c_{10}^T & \gamma_{11} & c_{12}^T \\ \hline C_{20} & c_{21} & C_{22} \end{array}\right)$$

endwhile