Step	Algorithm: $[C] := \text{SYR2K\_LN\_UNB\_VAR9}(A, B, C)$
1a	$\{C = \widehat{C}$ $\}$
4	$A \rightarrow \left(\begin{array}{c\|c} A_L & A_R \end{array} \right)$, $B \rightarrow \left(\begin{array}{c\|c} B_L & B_R \end{array} \right)$ where A_L has 0 columns, B_L has 0 columns
2	$\{C = A_L B_L^T + B_L A_L^T + \widehat{C}$ $\}$
3	while $n(A_L) < n(A)$ do
2,3	$\left\{ C = A_L B_L^T + B_L A_L^T + \widehat{C} \wedge n(A_L) < n(A) \right\}$
5a	$\left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \rightarrow \left(\begin{array}{c\|cc} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array} \right) \rightarrow \left(\begin{array}{c\|cc} B_0 & b_1 & B_2 \end{array} \right)$ where a_1 has 1 column, b_1 has 1 column
6	$\{ C = A_0 {B_0}^T + B_0 {A_0}^T + \widehat{C}$ $\}$
8	$C := a_1 b_1^T + b_1 a_1^T + C$
7	$\{ C = A_0 {B_0}^T + B_0 {A_0}^T + a_1 b_1^T + b_1 a_1^T + \widehat{C}$ $\}$
5b	$\left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \leftarrow \left(\begin{array}{cc\|c} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array} \right) \leftarrow \left(\begin{array}{cc\|c} B_0 & b_1 & B_2 \end{array} \right)$
2	$\{ C = A_L B_L^T + B_L A_L^T + \widehat{C}$ $\}$
	endwhile
2,3	$\{C = A_L B_L^T + B_L A_L^T + \widehat{C} \wedge \neg(n(A_L) < n(A))$ $\}$
1b	$\{[C] = \text{syr2k\_ln}(A, B, \widehat{C})$ $\}$

Step	Algorithm: $[C] := \text{SYR2K\_LN\_UNB\_VAR9}(A, B, C)$
1a	$\{$ $\}$
4	where
2	$\{$ $\}$
3	while do
2,3	$\{$ $\wedge$ $\}$
5a	where
6	$\{$ $\}$
8	
7	$\{$ $\}$
5b	
2	$\{$ $\}$
	endwhile
2,3	$\{$ $\wedge \neg($ $)$ $\}$
1b	$\{$ $\}$

Step	Algorithm: $[C] := \text{SYR2K\_LN\_UNB\_VAR9}(A, B, C)$
1a	$\{C = \widehat{C}$ $\}$
4	where
2	$\{$ $\}$
3	while do
2,3	$\{$ $\wedge$ $\}$
5a	where
6	$\{$ $\}$
8	
7	$\{$ $\}$
5b	
2	$\{$ $\}$
	endwhile
2,3	$\{$ $\wedge \neg($ $)$ $\}$
1b	$\{[C] = \text{syr2k\_ln}(A, B, \widehat{C})$ $\}$

Step	Algorithm: $[C] := \text{SYR2K\_LN\_UNB\_VAR9}(A, B, C)$
1a	$\{C = \widehat{C}$ $\}$
4	where
2	$\{C = A_L B_L^T + B_L A_L^T + \widehat{C}$ $\}$
3	while do
2,3	$\left\{ C = A_L B_L^T + B_L A_L^T + \widehat{C} \wedge \right\}$
5a	where
6	$\{$ $\}$
8	
7	$\{$ $\}$
5b	
2	$\{ C = A_L B_L^T + B_L A_L^T + \widehat{C}$ $\}$
	endwhile
2,3	$\{C = A_L B_L^T + B_L A_L^T + \widehat{C} \wedge \neg($ $)$ $\}$
1b	$\{[C] = \text{syr2k\_ln}(A, B, \widehat{C})$ $\}$

Step	Algorithm: $[C] := \text{SYR2K\_LN\_UNB\_VAR9}(A, B, C)$
1a	$\{C = \widehat{C}$ $\}$
4	where
2	$\{C = A_L B_L^T + B_L A_L^T + \widehat{C}$ $\}$
3	while $n(A_L) < n(A)$ do
2,3	$\left\{ C = A_L B_L^T + B_L A_L^T + \widehat{C} \wedge n(A_L) < n(A) \right\}$
5a	where
6	$\{$ $\}$
8	
7	$\{$ $\}$
5b	
2	$\{ C = A_L B_L^T + B_L A_L^T + \widehat{C}$ $\}$
	endwhile
2,3	$\{C = A_L B_L^T + B_L A_L^T + \widehat{C} \wedge \neg(n(A_L) < n(A))$ $\}$
1b	$\{[C] = \text{syr2k\_ln}(A, B, \widehat{C})$ $\}$

Step	Algorithm: $[C] := \text{SYR2K\_LN\_UNB\_VAR9}(A, B, C)$
1a	$\{C = \widehat{C}$ $\}$
4	$A \rightarrow \left(\begin{array}{c\|c} A_L & A_R \end{array}\right)$, $B \rightarrow \left(\begin{array}{c\|c} B_L & B_R \end{array}\right)$ where A_L has 0 columns, B_L has 0 columns
2	$\{C = A_L B_L^T + B_L A_L^T + \widehat{C}$ $\}$
3	while $n(A_L) < n(A)$ do
2,3	$\left\{ C = A_L B_L^T + B_L A_L^T + \widehat{C} \wedge n(A_L) < n(A) \right\}$
5a	where
6	$\{$ $\}$
8	
7	$\{$ $\}$
5b	
2	$\{ C = A_L B_L^T + B_L A_L^T + \widehat{C}$ $\}$
	endwhile
2,3	$\{C = A_L B_L^T + B_L A_L^T + \widehat{C} \wedge \neg(n(A_L) < n(A))$ $\}$
1b	$\{[C] = \text{syr2k\_ln}(A, B, \widehat{C})$ $\}$

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2	$\{C = A_L B_L^T + B_L A_L^T + \widehat{C}$ $\}$
3	while $n(A_L) < n(A)$ do
2,3	$\left\{ C = A_L B_L^T + B_L A_L^T + \widehat{C} \wedge n(A_L) < n(A) \right\}$
5a	$\left(\begin{array}{c\|c} A_L & A_R \end{array}\right) \rightarrow \left(\begin{array}{c\|cc} A_0 & a_1 & A_2 \end{array}\right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array}\right) \rightarrow \left(\begin{array}{c\|cc} B_0 & b_1 & B_2 \end{array}\right)$ where a_1 has 1 column, b_1 has 1 column
6	$\{$ $\}$
8	
7	$\{$ $\}$
5b	$\left(\begin{array}{c\|c} A_L & A_R \end{array}\right) \leftarrow \left(\begin{array}{cc\|c} A_0 & a_1 & A_2 \end{array}\right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array}\right) \leftarrow \left(\begin{array}{cc\|c} B_0 & b_1 & B_2 \end{array}\right)$
2	$\{ C = A_L B_L^T + B_L A_L^T + \widehat{C}$ $\}$
	endwhile
2,3	$\{C = A_L B_L^T + B_L A_L^T + \widehat{C} \wedge \neg(n(A_L) < n(A))$ $\}$
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3	while $n(A_L) < n(A)$ do
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5a	$\left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \rightarrow \left(\begin{array}{c\|cc} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array} \right) \rightarrow \left(\begin{array}{c\|cc} B_0 & b_1 & B_2 \end{array} \right)$ where a_1 has 1 column, b_1 has 1 column
6	$\{ C = A_0 B_0{}^T + B_0 A_0{}^T + \widehat{C}$ $\}$
8	
7	$\{$ $\}$
5b	$\left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \leftarrow \left(\begin{array}{cc\|c} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array} \right) \leftarrow \left(\begin{array}{cc\|c} B_0 & b_1 & B_2 \end{array} \right)$
2	$\{ C = A_L B_L^T + B_L A_L^T + \widehat{C}$ $\}$
	endwhile
2,3	$\{C = A_L B_L^T + B_L A_L^T + \widehat{C} \wedge \neg(n(A_L) < n(A))$ $\}$
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5a	$\left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \rightarrow \left(\begin{array}{c\|cc} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array} \right) \rightarrow \left(\begin{array}{c\|cc} B_0 & b_1 & B_2 \end{array} \right)$ where a_1 has 1 column, b_1 has 1 column
6	$\{ C = A_0 B_0{}^T + B_0 A_0{}^T + \widehat{C}$ $\}$
8	
7	$\{ C = A_0 B_0{}^T + B_0 A_0{}^T + a_1 b_1^T + b_1 a_1^T + \widehat{C}$ $\}$
5b	$\left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \leftarrow \left(\begin{array}{cc\|c} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array} \right) \leftarrow \left(\begin{array}{cc\|c} B_0 & b_1 & B_2 \end{array} \right)$
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5a	$\left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \rightarrow \left(\begin{array}{c\|cc} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array} \right) \rightarrow \left(\begin{array}{c\|cc} B_0 & b_1 & B_2 \end{array} \right)$ where a_1 has 1 column, b_1 has 1 column
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5b	$\left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \leftarrow \left(\begin{array}{cc\|c} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array} \right) \leftarrow \left(\begin{array}{cc\|c} B_0 & b_1 & B_2 \end{array} \right)$
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	while $n(A_L) < n(A)$ do
	$\left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \rightarrow \left(\begin{array}{c\|cc} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array} \right) \rightarrow \left(\begin{array}{c\|cc} B_0 & b_1 & B_2 \end{array} \right)$ where a_1 has 1 column, b_1 has 1 column
	$C := a_1 b_1^T + b_1 a_1^T + C$
	$\left(\begin{array}{c\|c} A_L & A_R \end{array} \right) \leftarrow \left(\begin{array}{cc\|c} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c\|c} B_L & B_R \end{array} \right) \leftarrow \left(\begin{array}{cc\|c} B_0 & b_1 & B_2 \end{array} \right)$
	endwhile

Algorithm: $[C] := \text{SYR2K\_LN\_UNB\_VAR9}(A, B, C)$

$A \rightarrow \left(\begin{array}{c|c} A_L & A_R \end{array} \right)$, $B \rightarrow \left(\begin{array}{c|c} B_L & B_R \end{array} \right)$

where A_L has 0 columns, B_L has 0 columns

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

$\left(\begin{array}{c|c} A_L & A_R \end{array} \right) \rightarrow \left(\begin{array}{c|cc} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c|c} B_L & B_R \end{array} \right) \rightarrow \left(\begin{array}{c|cc} B_0 & b_1 & B_2 \end{array} \right)$

where a_1 has 1 column, b_1 has 1 column

$C := a_1 b_1^T + b_1 a_1^T + C$

$\left(\begin{array}{c|c} A_L & A_R \end{array} \right) \leftarrow \left(\begin{array}{cc|c} A_0 & a_1 & A_2 \end{array} \right)$, $\left(\begin{array}{c|c} B_L & B_R \end{array} \right) \leftarrow \left(\begin{array}{cc|c} B_0 & b_1 & B_2 \end{array} \right)$

endwhile