

Wzory na szczelinę zastępczą dla kilku skrajnie niesymetrycznych układów cewek

I	1 2 k N Δ_1 Δ_2 Δ_k Δ_g A_1 A_2 A_k A_N C_{1Z} C_{2Z} C_{kZ} C_{NZ} δ_1 δ_2 δ_k δ_N a_1 a_2 a_k a_N C_{1Z} C_{2Z} C_{kZ} C_{NZ} δ_1 δ_2 δ_k δ_N a_1 a_2 a_k a_N C_{1Z} C_{2Z} C_{kZ} C_{NZ} N cewek n cewek Wzory w postaci ogólnej	1. $\delta' = \Delta_g + \sum_{k=1}^N \Delta_k \left(\frac{k}{N} C_i \right)^2 + \sum_{k=1}^n \delta_k \left(\frac{k}{n} C_i \right)^2 + \frac{1}{3} \left(\sum_{k=1}^N A_k C_k^2 + \sum_{k=1}^n a_k C_k^2 \right) + \sum_{k=1}^N A_k \left(\frac{k}{N} C_i \right) \left(\frac{k}{N} C_i \right) + \sum_{k=1}^n a_k \left(\frac{k}{n} C_i \right) \left(\frac{k}{n} C_i \right)$		
	2. $\delta' = \Delta_g + \frac{k-1}{k} \Delta_k \left(\frac{k}{N} \right)^2 + \sum_{k=1}^n \delta_k \left(1 - \frac{k}{n} \right)^2 + \frac{1}{3} \left(\frac{1}{N^2} \sum_{k=1}^N A_k + \frac{1}{n^2} \sum_{k=1}^n a_k \right) + \sum_{k=1}^N A_k \frac{k(k-1)}{N^2} + \sum_{k=1}^n a_k \left(1 - \frac{k}{n} \right) \left(1 - \frac{k-1}{n} \right)$			
	3. $\delta' = \Delta_g + \Delta \frac{(N-1)(2N-1)}{6N} + \delta \frac{(n-1)(2n-1)}{6n} + \frac{AN+an}{3}$			
II	1 2 A a z z Δ_g z $N=1; \quad n=1$	1. $\delta' = \Delta_g + \frac{A+a}{3}$	2. $\delta' = \Delta_g + \frac{A+a}{3}$	3. $\delta' = \Delta_g + \frac{A+a}{3}$
III	1 2 A_1 A_2 C_{1Z} C_{2Z} Δ_1 Δ_g a z z z $N=2; \quad n=1$	1. $\delta' = \Delta_g + \Delta_1 C_1^2 + \frac{A_1 C_1^2 + A_2 C_2^2 + a}{3} + A_2 C_1$	2. $\delta' = \Delta_g + \frac{\Delta_1}{4} + \frac{A_1 + 7A_2}{3 \cdot 4} + \frac{a}{3}$	3. $\delta' = \Delta_g + \frac{\Delta}{4} + \frac{2A+a}{3}$
IV	1 2 3 A_1 A_2 A_3 C_{1Z} C_{2Z} C_{3Z} Δ_1 Δ_2 Δ_g a z z z $N=3; \quad n=1$	1. $\delta' = \Delta_g + \Delta_1 C_1^2 + \Delta_2 (1-C_3)^2 + \frac{A_1 C_1^2 + A_2 C_2^2 + A_3 C_3^2 + a}{3} + A_2 C_1 (1-C_3) + A_3 (1-C_3)$	2. $\delta' = \Delta_g + \frac{\Delta_1 + 4\Delta_2}{9} + \frac{A_1 + 7A_2 + 19A_3}{3 \cdot 9} + \frac{a}{3}$	3. $\delta' = \Delta_g + \frac{5\Delta}{9} + \frac{3A+a}{3}$
V	1 2 A_1 A_2 C_{1Z} C_{2Z} Δ_1 Δ_g a_1 δ_1 a_2 δ_2 δ_1 δ_2 a_1 a_2 C_{1Z} C_{2Z} $N=2; \quad n=2$	1. $\delta' = \Delta_g + \Delta_1 C_1^2 + \delta_1 C_2^2 + \frac{A_1 C_1^2 + A_2 C_2^2 + a_1 C_1^2 + a_2 C_2^2}{3} + A_2 C_1 + a_1 C_2$	2. $\delta' = \Delta_g + \frac{\Delta_1}{4} + \frac{\delta_1}{4} + \frac{A_1 + 7A_2}{3 \cdot 4} + \frac{7a_1 + a_2}{3 \cdot 4}$	3. $\delta' = \Delta_g + \frac{\Delta + \delta}{4} + \frac{2A + 2a}{3}$
VI	1 2 3 A_1 A_2 A_3 C_{1Z} C_{2Z} C_{3Z} Δ_1 Δ_2 Δ_g a_1 δ_1 a_2 δ_2 δ_1 δ_2 a_1 a_2 C_{1Z} C_{2Z} $N=3; \quad n=2$	1. $\delta' = \Delta_g + \Delta_1 C_1^2 + \Delta_2 (1-C_3)^2 + \delta_1 C_2^2 + \frac{A_1 C_1^2 + A_2 C_2^2 + A_3 C_3^2 + a_1 C_1^2 + a_2 C_2^2}{3} + A_2 C_1 (1-C_3) + A_3 (1-C_3) + a_1 C_2$		
	2. $\delta' = \Delta_g + \frac{\Delta_1 + 4\Delta_2}{9} + \frac{\delta_1}{4} + \frac{A_1 + 7A_2 + 19A_3}{3 \cdot 9} + \frac{7a_1 + a_2}{3 \cdot 4}$		3. $\delta' = \Delta_g + \frac{5\Delta}{9} + \frac{\delta}{4} + \frac{3A + 2a}{3}$	
VII	1 2 3 4 A_1 A_2 A_3 A_4 C_{1Z} C_{2Z} C_{3Z} C_{4Z} Δ_1 Δ_2 Δ_3 Δ_g a_1 δ_1 a_2 δ_2 δ_1 δ_2 a_1 a_2 C_{1Z} C_{2Z} $N=4; \quad n=2$	1. $\delta' = \Delta_g + \Delta_1 C_1^2 + \Delta_2 (C_1 + C_2)^2 + \Delta_3 (1-C_4)^2 + \delta_1 C_2^2 + \frac{A_1 C_1^2 + A_2 C_2^2 + A_3 C_3^2 + A_4 C_4^2 + a_1 C_1^2 + a_2 C_2^2}{3} + A_2 C_1 (C_1 + C_2) + A_3 (C_1 + C_2) (1-C_4) + A_4 (1-C_4) + a_1 C_2$		
	2. $\delta' = \Delta_g + \frac{\Delta_1 + 4\Delta_2 + 9\Delta_3}{16} + \frac{\delta_1}{4} + \frac{A_1 + 7A_2 + 19A_3 + 37A_4}{3 \cdot 16} + \frac{7a_1 + a_2}{3 \cdot 4}$		3. $\delta' = \Delta_g + \frac{7\Delta}{8} + \frac{\delta}{4} + \frac{4A + 2a}{3}$	
VIII	1 2 3 A_1 A_2 A_3 C_{1Z} C_{2Z} C_{3Z} Δ_1 Δ_2 Δ_g a_1 δ_1 a_2 δ_2 δ_1 δ_2 a_1 a_2 C_{1Z} C_{2Z} $N=3; \quad n=3$	1. $\delta' = \Delta_g + \Delta_1 C_1^2 + \Delta_2 (1-C_3)^2 + \delta_1 (1-C_1)^2 + \delta_2 C_2^2 + \frac{A_1 C_1^2 + A_2 C_2^2 + A_3 C_3^2 + a_1 C_1^2 + a_2 C_2^2 + a_3 C_3^2}{3} + A_2 C_1 (1-C_3) + A_3 (1-C_3) + a_1 (1-C_1) + a_2 (1-C_1) C_3$		
	2. $\delta' = \Delta_g + \frac{\Delta_1 + 4\Delta_2}{9} + \frac{4\delta_1 + \delta_2}{9} + \frac{A_1 + 7A_2 + 19A_3}{3 \cdot 9} + \frac{19a_1 + 7a_2 + a_3}{3 \cdot 9}$		3. $\delta' = \Delta_g + \frac{5\Delta}{9} + \frac{5\delta}{9} + A + a$	
IX	1 2 3 4 A_1 A_2 A_3 A_4 C_{1Z} C_{2Z} C_{3Z} C_{4Z} Δ_1 Δ_2 Δ_3 Δ_g a_1 δ_1 a_2 δ_2 δ_1 δ_2 a_1 a_2 C_{1Z} C_{2Z} $N=4; \quad n=3$	1. $\delta' = \Delta_g + \Delta_1 C_1^2 + \Delta_2 (C_1 + C_2)^2 + \Delta_3 (1-C_4)^2 + \delta_1 (1-C_1)^2 + \delta_2 C_3^2 + \frac{A_1 C_1^2 + A_2 C_2^2 + A_3 C_3^2 + A_4 C_4^2 + a_1 C_1^2 + a_2 C_2^2 + a_3 C_3^2}{3} + A_2 C_1 (C_1 + C_2) + A_3 (C_1 + C_2) (1-C_4) + A_4 (1-C_4) + a_1 (1-C_1) + a_2 (1-C_1) C_3$		
	2. $\delta' = \Delta_g + \frac{\Delta_1 + 4\Delta_2 + 9\Delta_3}{16} + \frac{4\delta_1 + \delta_2}{9} + \frac{A_1 + 7A_2 + 19A_3 + 37A_4}{3 \cdot 16} + \frac{19a_1 + 7a_2 + a_3}{3 \cdot 9}$		3. $\delta' = \Delta_g + \frac{7\Delta}{8} + \frac{5\delta}{9} + \frac{4A + 3a}{3}$	
X	1 2 3 4 5 A_1 A_2 A_3 A_4 A_5 C_{1Z} C_{2Z} C_{3Z} C_{4Z} C_{5Z} Δ_1 Δ_2 Δ_3 Δ_4 Δ_g a_1 δ_1 a_2 δ_2 δ_1 δ_2 a_1 a_2 C_{1Z} C_{2Z} $N=5; \quad n=3$	1. $\delta' = \Delta_g + \Delta_1 C_1^2 + \Delta_2 (C_1 + C_2)^2 + \Delta_3 [1 - (C_4 + C_5)]^2 + \Delta_4 (1-C_5)^2 + \delta_1 (1-C_1)^2 + \delta_2 C_3^2 + \frac{A_1 C_1^2 + A_2 C_2^2 + A_3 C_3^2 + A_4 C_4^2 + A_5 C_5^2 + a_1 C_1^2 + a_2 C_2^2 + a_3 C_3^2}{3} + A_2 C_1 (C_1 + C_2) + A_3 (C_1 + C_2) [1 - (C_4 + C_5)] + A_4 [1 - (C_4 + C_5)] (1-C_5) + A_5 (1-C_5) + a_1 (1-C_1) + a_2 (1-C_1) C_3$		
2. $\delta' = \Delta_g + \frac{\Delta_1 + 4\Delta_2 + 9\Delta_3 + 16\Delta_4}{25} + \frac{4\delta_1 + \delta_2}{9} + \frac{A_1 + 7A_2 + 19A_3 + 37A_4 + 61A_5}{3 \cdot 25} + \frac{19a_1 + 7a_2 + a_3}{3 \cdot 9}$		3. $\delta' = \Delta_g + \frac{6\Delta}{5} + \frac{5\delta}{9} + \frac{5A + 3a}{3}$		