Seriekobling af to modstande: R3=R1+R2

R1=2.4 kOhm+-5% ~U[2280;2520]

$$f_{r1}(r_1) := \begin{Vmatrix} \text{if } 2280 \leq r_1 \leq 2520 \\ \quad \begin{Vmatrix} \dfrac{1}{240} \end{Vmatrix} \\ \text{else} \\ \quad \begin{Vmatrix} 0 \end{Vmatrix} \end{Vmatrix}$$

R2=100 Ohm+-5% ~U[95;105]

$$f_{r2}(r_2) := \begin{Vmatrix} \text{if } 95 \leq r_2 \leq 105 \\ \quad \begin{Vmatrix} \dfrac{1}{10} \end{Vmatrix} \\ \text{else} \\ \quad \begin{Vmatrix} 0 \end{Vmatrix} \end{Vmatrix}$$

R3=R1+R2: $\quad f_{r3}(r_3) = \displaystyle\int_{-\infty}^{\infty} f_{r1}(\rho) \cdot f_{r2}(r_3 - \rho)\, d\rho \quad$ $2280 \leq \rho \leq 2520$ **og** $r_3 - 105 \leq \rho \leq r_3 - 95$ $(95 \leq r_3 - \rho \leq 105)$

$$f_{r3}(r_3) := \begin{Vmatrix} \text{if } r_3 < 2375 \\ \quad 0 \\ \text{else if } 2375 \leq r_3 < 2385 \\ \quad \displaystyle\int_{2280}^{r_3 - 95} \dfrac{1}{240} \cdot \dfrac{1}{10}\, d\rho \\ \text{else if } 2385 \leq r_3 \leq 2615 \\ \quad \displaystyle\int_{r_3 - 105}^{r_3 - 95} \dfrac{1}{240} \cdot \dfrac{1}{10}\, d\rho \\ \text{else if } 2615 < r_3 \leq 2625 \\ \quad \displaystyle\int_{r_3 - 105}^{2520} \dfrac{1}{240} \cdot \dfrac{1}{10}\, d\rho \\ \text{else if } r_3 > 2625 \\ \quad 0 \end{Vmatrix}$$

$$f_{r31}(r_3) := \int_{2280}^{r_3 - 95} \frac{1}{240} \cdot \frac{1}{10}\, d\rho \rightarrow \frac{r_3}{2400} - \frac{95}{96}$$

$$f_{r32}(r_3) := \int_{r_3 - 105}^{r_3 - 95} \frac{1}{240} \cdot \frac{1}{10}\, d\rho \rightarrow \frac{1}{240}$$

$$f_{r33}(r_3) := \int_{r_3 - 105}^{2520} \frac{1}{240} \cdot \frac{1}{10}\, d\rho \rightarrow \frac{35}{32} - \frac{r_3}{2400}$$

$$\underline{f_{r3}(r_3)}$$

$$\underline{r_3}$$

$$EZZ := \int_{2375}^{2385} r_3^2 \cdot \left(\frac{r_3}{2400} - \frac{95}{96} \right) dr_3 + \int_{2385}^{2615} r_3^2 \cdot \left(\frac{1}{240} \right) dr_3 + \int_{2615}^{2625} r_3^2 \cdot \left(-\frac{r_3}{2400} + \frac{35}{32} \right) dr_3 = 6.255 \cdot 10^6$$

$$EZ := \int_{2375}^{2385} r_3 \cdot \left(\frac{r_3}{2400} - \frac{95}{96} \right) dr_3 + \int_{2385}^{2615} r_3 \cdot \left(\frac{1}{240} \right) dr_3 + \int_{2615}^{2625} r_3 \cdot \left(-\frac{r_3}{2400} + \frac{35}{32} \right) dr_3 = 2500$$

$$VarZ := EZZ - EZ^2 = 4808.333 \qquad\qquad \sigma_Z := \sqrt{VarZ} = 69.342$$

$$VarU_{2375;2625} := \frac{(2625 - 2375)^2}{12} = 5208.333 \qquad\qquad \sigma_U := \sqrt{VarU_{2375;2625}} = 72.169 \quad > \sigma_Z$$

Seriekobling af to modstande: R3=R1+R2

R1=1.25 kOhm+-5% ~U[1187.5;1312.5]

$$f_{r1}(r_1) := \begin{Vmatrix} \text{if } 1187.5 \le r_1 \le 1312.5 \\ \quad \begin{Vmatrix} \dfrac{1}{125} \end{Vmatrix} \\ \text{else} \\ \quad \begin{Vmatrix} 0 \end{Vmatrix} \end{Vmatrix}$$

R2=1.25 kOhm+-5% ~U[1187.5;1312.5]

$$f_{r2}(r_2) := \begin{Vmatrix} \text{if } 1187.5 \le r_2 \le 1312.5 \\ \quad \begin{Vmatrix} \dfrac{1}{125} \end{Vmatrix} \\ \text{else} \\ \quad \begin{Vmatrix} 0 \end{Vmatrix} \end{Vmatrix}$$

R3=R1+R2:
$$f_{r3}(r_3) = \int_{-\infty}^{\infty} f_{r1}(\rho) \cdot f_{r2}(r_3 - \rho) \, d\rho \qquad 1187.5 \le \rho \le 1312.5 \ \text{ og } \ r_3 - 1312.5 \le \rho \le r_3 - 1187.5$$
$$(1187.5 \le r_3 - \rho \le 1312.5)$$

$$f_{r3}(r_3) := \begin{Vmatrix} \text{if } r_3 < 2375 \\ \quad \begin{Vmatrix} 0 \end{Vmatrix} \\ \text{else if } 2375 \le r_3 \le 2500 \\ \quad \begin{Vmatrix} \displaystyle\int_{1187.5}^{r_3 - 1187.5} \dfrac{1}{125} \cdot \dfrac{1}{125} \, d\rho \end{Vmatrix} \\ \text{else if } 2500 \le r_3 \le 2625 \\ \quad \begin{Vmatrix} \displaystyle\int_{r_3 - 1312.5}^{1312.5} \dfrac{1}{125} \cdot \dfrac{1}{125} \, d\rho \end{Vmatrix} \\ \text{else if } r_3 > 2625 \\ \quad \begin{Vmatrix} 0 \end{Vmatrix} \end{Vmatrix}$$

$$f_{r31}(r_3) := \int_{1187.5}^{r_3 - 1187.5} \dfrac{1}{125} \cdot \dfrac{1}{125} \, d\rho \to \int_{1187.5}^{r_3 - 1187.5} \dfrac{1}{15625} \, d\rho$$

$$f_{r31}(r_3) := \dfrac{1}{125^2} \cdot (r_3 - 1187.5 - 1187.5) \to \dfrac{r_3}{15625} - 0.152$$

$$f_{r33}(r_3) := \int_{r_3 - 1312.5}^{1312.5} \dfrac{1}{125} \cdot \dfrac{1}{125} \, d\rho \to \int_{r_3 - 1312.5}^{1312.5} \dfrac{1}{15625} \, d\rho$$

$$f_{r33}(r_3) := \dfrac{1}{125^2} \cdot (1312.5 - (r_3 - 1312.5)) \to 0.168 - \dfrac{r_3}{15625}$$

$$\underline{f_{r3}(r_3)}$$

$$\underline{r_3}$$
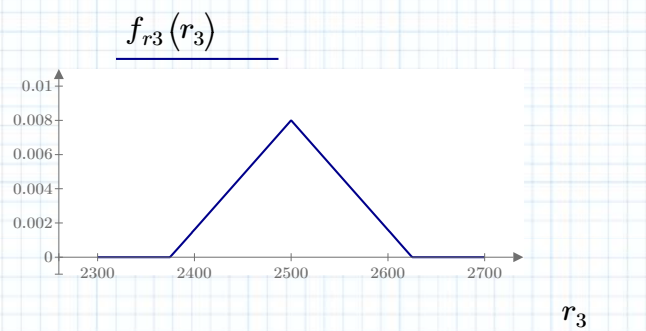
$$EZZ := \int_{2375}^{2500} r_3^2 \cdot \left(\dfrac{r_3}{15625} - 0.152 \right) dr_3 + \int_{2500}^{2625} r_3^2 \cdot \left(0.168 - \dfrac{r_3}{15625} \right) dr_3 = 6.253 \cdot 10^6$$

$$EZ := \int_{2375}^{2500} r_3 \cdot \left(\dfrac{r_3}{15625} - 0.152 \right) dr_3 + \int_{2500}^{2625} r_3 \cdot \left(0.168 - \dfrac{r_3}{15625} \right) dr_3 = 2500$$

$$VarZ := EZZ - EZ^2 = 2604.167 \qquad\qquad \sigma_Z := \sqrt{VarZ} = 51.031$$

$$VarU_{2375;2625} := \dfrac{(2625 - 2375)^2}{12} = 5208.333 \qquad\qquad \sigma_U := \sqrt{VarU_{2375;2625}} = 72.169 \quad > \sigma_Z$$