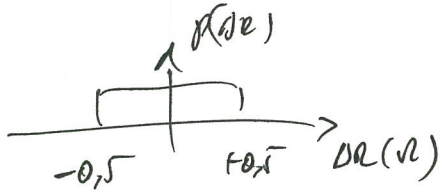
1. $\hat{R} = \bar{R} = 100{,}45\,\Omega$ $\quad N = 80$, CHT $\Rightarrow$ normális eloszlás használható. $\quad s_1 = 1{,}23\,\Omega \quad s' = \frac{s_1}{\sqrt{80}} = 0{,}137\,\Omega$ (1)

A

$\Delta R = s' \cdot \underbrace{z_{0{,}995}}_{2{,}58} = 0{,}354\,\Omega$

$P[\hat{R} - \Delta R < R < \hat{R} + \Delta R] = 1 - b$

$P[100{,}11\,\Omega < R < 100{,}80\,\Omega] = 99\%$ (2)

Vereh.: 

$s_q = \frac{\Delta R}{\sqrt{3}} = \frac{0{,}5\,\Omega}{\sqrt{3}} = 0{,}2887\,\Omega \quad s_2 = \sqrt{s_1^2 - s_q^2} = 1{,}195\,\Omega$

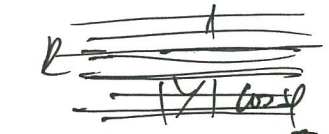
$s_2' = \frac{s_2}{\sqrt{80}} = 0{,}133\,\Omega$

$\Delta R_2 = s_2' \cdot z_{0{,}995} = 0{,}343\,\Omega$

$P[\hat{R} - \Delta R_2 < R < \hat{R} + \Delta R_2] = 1 - b$

$P[100{,}10\,\Omega < R < 100{,}79\,\Omega] = 99\%$ (2)

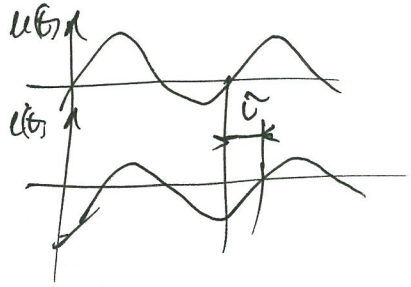
5

II. $R + \frac{1}{j\omega C} = |Z|[\cos\varphi + j\sin\varphi]$ $\quad$  $\quad R = |Z|\cos\varphi = 10{,}01\,\Omega \quad C = \frac{-1}{|Z|\sin\varphi\,\omega} = 3\,nF$ (2)

$\omega = 2\pi f \cong 10^6\,\frac{1}{s}$

$\frac{\Delta C}{C} = \frac{\Delta|Z|}{|Z|} + \left|\frac{\Delta\sin\varphi}{\sin\varphi}\right| = \frac{\Delta|Z|}{|Z|} + |\operatorname{ctg}\varphi\,\Delta\varphi| = 0{,}16\%$ (2)

5

Fázsmérés: időintervallum-mérésre visszavezetve: 

$\varphi = 2\pi \frac{\tau}{T_x} = 2\pi\,\tau\,f_x$ $\quad f_x$-et ismerjük.

(1)