

PRÍLOHA:

Príloha č. 1: Vzorové výpočty výkonov

Zadané hodnoty - vedenie 400 kV	Zadané hodnoty - vedenie 110 kV	Zadané hodnoty - vedenie 22 kV
$U1 = 241.2486 * \text{Exp}[I * 0 * \text{Degree}]$ $U2 = 221.7136 * \text{Exp}[I * 23.18396 * \text{Degree}]$ $I1 = 2.081171 * \text{Exp}[I * 19.93042 * \text{Degree}]$ $I2 = 2.079759 * \text{Exp}[I * 22.34012 * \text{Degree}]$	$U1 = 75.94848 * \text{Exp}[I * 0 * \text{Degree}]$ $U2 = 69.29182 * \text{Exp}[I * 10.43231 * \text{Degree}]$ $I1 = 0.71272 * \text{Exp}[I * 10.32051 * \text{Degree}]$ $I2 = 0.706856 * \text{Exp}[I * 9.774925 * \text{Degree}]$	$U1 = 148.2067 * \text{Exp}[I * 0 * \text{Degree}]$ $U2 = 144.2608 * \text{Exp}[I * 5.245947 * \text{Degree}]$ $I1 = 1.36149 * \text{Exp}[I * 5.115466 * \text{Degree}]$ $I2 = 1.343314 * \text{Exp}[I * 4.553764 * \text{Degree}]$
241.249 203.809 + 87.2852 i 1.95652 + 0.709427 i 1.92366 + 0.790525 i	Out[1]= 75.9485 Out[2]= 68.1464 + 12.5469 i Out[3]= 0.701189 + 0.127687 i Out[4]= 0.696594 + 0.120009 i	Out[1]= 148.207 Out[2]= 143.657 + 13.1899 i Out[3]= 1.35607 + 0.121395 i Out[4]= 1.33907 + 0.106652 i
Výkony na začiatku vedenia	Výkony na začiatku vedenia	Výkony na začiatku vedenia
$S1 = U1 * I1$ 472.009 + 171.148 i $P1 = \text{Re}[S1]$ 472.009 $Q1 = \text{Im}[S1]$ 171.148 $S11 = \text{List}[\text{Abs}[S1], \text{Arg}[S1] * (180 / \text{Pi})]$ {502.08, 19.9304}	$ln[S]= S1 = U1 * I1$ Out[S]= 53.2542 + 9.69763 i $ln[S]= P1 = \text{Re}[S1]$ Out[S]= 53.2542 $ln[S]= Q1 = \text{Im}[S1]$ Out[S]= 9.69763 $ln[S]= S11 = \text{List}[\text{Abs}[S1], \text{Arg}[S1] * (180 / \text{Pi})]$ Out[S]= {54.13, 10.3205}	$ln[S]= S1 = U1 * I1$ Out[S]= 200.978 + 17.9915 i $ln[S]= P1 = \text{Re}[S1]$ Out[S]= 200.978 $ln[S]= Q1 = \text{Im}[S1]$ Out[S]= 17.9915 $ln[S]= S11 = \text{List}[\text{Abs}[S1], \text{Arg}[S1] * (180 / \text{Pi})]$ Out[S]= {201.782, 5.11547}
Výkony na konci vedenia	Výkony na konci vedenia	Výkony na konci vedenia
$S2 = U2 * I2$ 323.059 + 329.023 i $P2 = \text{Re}[S1]$ 472.009 $Q2 = \text{Im}[S1]$ 171.148 $S22 = \text{List}[\text{Abs}[S2], \text{Arg}[S2] * (180 / \text{Pi})]$ {461.111, 45.5241}	$ln[S]= S2 = U2 * I2$ Out[S]= 45.9646 + 16.9183 i $ln[S]= P2 = \text{Re}[S1]$ Out[S]= 53.2542 $ln[S]= Q2 = \text{Im}[S1]$ Out[S]= 9.69763 $ln[S]= S22 = \text{List}[\text{Abs}[S2], \text{Arg}[S2] * (180 / \text{Pi})]$ Out[S]= {48.9793, 20.2072}	$ln[S]= S2 = U2 * I2$ Out[S]= 190.96 + 32.9835 i $ln[S]= P2 = \text{Re}[S1]$ Out[S]= 200.978 $ln[S]= Q2 = \text{Im}[S1]$ Out[S]= 17.9915 $ln[S]= S22 = \text{List}[\text{Abs}[S2], \text{Arg}[S2] * (180 / \text{Pi})]$ Out[S]= {193.788, 9.79971}

Obr. 1 Vzorové výpočty výkonov

Príloha č. 2: Vyjadrenia elektrických parametrov a ich vzorové výpočty

$$\begin{aligned}
 \mathbf{Rov1} &= -\bar{I}_1 + \bar{U}_{f2} * (\bar{Y} * (1 + (5 * \bar{Y} * \bar{Z}) / 36 + (\bar{Y} * \bar{Z})^2 / 216)) \\
 &\quad + \bar{I}_2 * (1 + (\bar{Y} * \bar{Z}) / 2 + (\bar{Y} * \bar{Z})^2 / 36) \\
 &= -\bar{I}_1 + \left(1 + \frac{Y\bar{Z}}{2} + \frac{1}{36} \bar{Y}^2 \bar{Z}^2\right) \bar{I}_2 + \bar{Y} \left(1 + \frac{5Y\bar{Z}}{36} + \frac{1}{216} \bar{Y}^2 \bar{Z}^2\right) \bar{U}_{f2} \\
 \mathbf{Rov2} &= -\bar{U}_{f1} + \bar{U}_{f2} * (1 + (\bar{Y} * \bar{Z}) / 2 + (\bar{Y} * \bar{Z})^2 / 36) + \bar{I}_2 * \bar{Z} * (1 + (\bar{Y} * \bar{Z}) / 6) \\
 \bar{Z} &\left(1 + \frac{Y\bar{Z}}{6}\right) \bar{I}_2 - \bar{U}_{f1} + \left(1 + \frac{Y\bar{Z}}{2} + \frac{1}{36} \bar{Y}^2 \bar{Z}^2\right) \bar{U}_{f2} \\
 \mathbf{Solve} &[\{\mathbf{Rov1} == 0, \mathbf{Rov2} == 0\}, \{\bar{Y}, \bar{Z}\}]
 \end{aligned}$$

$$\begin{aligned}
 \left\{ \bar{Y} \rightarrow \frac{1}{2 (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \left(12 \bar{I}_1 \bar{U}_{f1} + 24 \bar{I}_2 \bar{U}_{f1} + 24 \bar{I}_1 \bar{U}_{f2} + 12 \bar{I}_2 \bar{U}_{f2} - \right. \right. \\
 \left. \left. \sqrt{(-12 \bar{I}_1 \bar{U}_{f1} - 24 \bar{I}_2 \bar{U}_{f1} - 24 \bar{I}_1 \bar{U}_{f2} - 12 \bar{I}_2 \bar{U}_{f2})^2 - 4 (36 \bar{I}_1^2 - 36 \bar{I}_2^2) (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \right), \bar{Z} \rightarrow \right. \\
 \left. \frac{1}{12 \bar{I}_1 \bar{I}_2 \bar{U}_{f1} + 12 \bar{I}_2^2 \bar{U}_{f1} + 12 \bar{I}_1^2 \bar{U}_{f2} + 12 \bar{I}_1 \bar{I}_2 \bar{U}_{f2}} \left(6 \bar{I}_1 \bar{U}_{f1}^2 + 18 \bar{I}_2 \bar{U}_{f1}^2 + 12 \bar{I}_1 \bar{U}_{f1} \bar{U}_{f2} - 12 \bar{I}_2 \bar{U}_{f1} \bar{U}_{f2} - \right. \right. \\
 18 \bar{I}_1 \bar{U}_{f2}^2 - 6 \bar{I}_2 \bar{U}_{f2}^2 - \frac{6 \bar{I}_1 \bar{U}_{f1}^4}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{12 \bar{I}_2 \bar{U}_{f1}^4}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{6 \bar{I}_1 \bar{U}_{f1}^3 \bar{U}_{f2}}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} + \frac{6 \bar{I}_2 \bar{U}_{f1}^3 \bar{U}_{f2}}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} + \frac{18 \bar{I}_1 \bar{U}_{f1}^2 \bar{U}_{f2}^2}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} + \\
 \left. \frac{18 \bar{I}_2 \bar{U}_{f1}^2 \bar{U}_{f2}^2}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} + \frac{6 \bar{I}_1 \bar{U}_{f1} \bar{U}_{f2}^3}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{6 \bar{I}_2 \bar{U}_{f1} \bar{U}_{f2}^3}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{12 \bar{I}_1 \bar{U}_{f2}^4}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{6 \bar{I}_2 \bar{U}_{f2}^4}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} + \frac{1}{2 (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \bar{U}_{f1}^3 \right. \\
 \left. \sqrt{(-12 \bar{I}_1 \bar{U}_{f1} - 24 \bar{I}_2 \bar{U}_{f1} - 24 \bar{I}_1 \bar{U}_{f2} - 12 \bar{I}_2 \bar{U}_{f2})^2 - 4 (36 \bar{I}_1^2 - 36 \bar{I}_2^2) (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} - \frac{1}{2 (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \right. \\
 \left. \bar{U}_{f1}^2 \bar{U}_{f2} \sqrt{(-12 \bar{I}_1 \bar{U}_{f1} - 24 \bar{I}_2 \bar{U}_{f1} - 24 \bar{I}_1 \bar{U}_{f2} - 12 \bar{I}_2 \bar{U}_{f2})^2 - 4 (36 \bar{I}_1^2 - 36 \bar{I}_2^2) (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} - \right. \\
 \left. \frac{1}{2 (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \bar{U}_{f1} \bar{U}_{f2}^2 \right. \\
 \left. \sqrt{(-12 \bar{I}_1 \bar{U}_{f1} - 24 \bar{I}_2 \bar{U}_{f1} - 24 \bar{I}_1 \bar{U}_{f2} - 12 \bar{I}_2 \bar{U}_{f2})^2 - 4 (36 \bar{I}_1^2 - 36 \bar{I}_2^2) (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} + \frac{1}{2 (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \right. \\
 \left. \bar{Y} \rightarrow \frac{1}{2 (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \left(12 \bar{I}_1 \bar{U}_{f1} + 24 \bar{I}_2 \bar{U}_{f1} + 24 \bar{I}_1 \bar{U}_{f2} + 12 \bar{I}_2 \bar{U}_{f2} + \right. \right. \\
 \left. \left. \sqrt{(-12 \bar{I}_1 \bar{U}_{f1} - 24 \bar{I}_2 \bar{U}_{f1} - 24 \bar{I}_1 \bar{U}_{f2} - 12 \bar{I}_2 \bar{U}_{f2})^2 - 4 (36 \bar{I}_1^2 - 36 \bar{I}_2^2) (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \right), \right. \\
 \left. \bar{Z} \rightarrow \frac{1}{12 \bar{I}_1 \bar{I}_2 \bar{U}_{f1} + 12 \bar{I}_2^2 \bar{U}_{f1} + 12 \bar{I}_1^2 \bar{U}_{f2} + 12 \bar{I}_1 \bar{I}_2 \bar{U}_{f2}} \left(6 \bar{I}_1 \bar{U}_{f1}^2 + 18 \bar{I}_2 \bar{U}_{f1}^2 + 12 \bar{I}_1 \bar{U}_{f1} \bar{U}_{f2} - 12 \bar{I}_2 \bar{U}_{f1} \bar{U}_{f2} - \right. \right. \\
 18 \bar{I}_1 \bar{U}_{f2}^2 - 6 \bar{I}_2 \bar{U}_{f2}^2 - \frac{6 \bar{I}_1 \bar{U}_{f1}^4}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{12 \bar{I}_2 \bar{U}_{f1}^4}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{6 \bar{I}_1 \bar{U}_{f1}^3 \bar{U}_{f2}}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} + \frac{6 \bar{I}_2 \bar{U}_{f1}^3 \bar{U}_{f2}}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} + \frac{18 \bar{I}_1 \bar{U}_{f1}^2 \bar{U}_{f2}^2}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} + \\
 \left. \frac{18 \bar{I}_2 \bar{U}_{f1}^2 \bar{U}_{f2}^2}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{6 \bar{I}_1 \bar{U}_{f1} \bar{U}_{f2}^3}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{6 \bar{I}_2 \bar{U}_{f1} \bar{U}_{f2}^3}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{12 \bar{I}_1 \bar{U}_{f2}^4}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{6 \bar{I}_2 \bar{U}_{f2}^4}{\bar{U}_{f1}^2 - \bar{U}_{f2}^2} - \frac{1}{2 (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \bar{U}_{f1}^3 \right. \\
 \left. \sqrt{(-12 \bar{I}_1 \bar{U}_{f1} - 24 \bar{I}_2 \bar{U}_{f1} - 24 \bar{I}_1 \bar{U}_{f2} - 12 \bar{I}_2 \bar{U}_{f2})^2 - 4 (36 \bar{I}_1^2 - 36 \bar{I}_2^2) (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} + \frac{1}{2 (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \right. \\
 \left. \bar{U}_{f1}^2 \bar{U}_{f2} \sqrt{(-12 \bar{I}_1 \bar{U}_{f1} - 24 \bar{I}_2 \bar{U}_{f1} - 24 \bar{I}_1 \bar{U}_{f2} - 12 \bar{I}_2 \bar{U}_{f2})^2 - 4 (36 \bar{I}_1^2 - 36 \bar{I}_2^2) (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} + \right. \\
 \left. \frac{1}{2 (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \bar{U}_{f1} \bar{U}_{f2}^2 \right. \\
 \left. \sqrt{(-12 \bar{I}_1 \bar{U}_{f1} - 24 \bar{I}_2 \bar{U}_{f1} - 24 \bar{I}_1 \bar{U}_{f2} - 12 \bar{I}_2 \bar{U}_{f2})^2 - 4 (36 \bar{I}_1^2 - 36 \bar{I}_2^2) (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} - \frac{1}{2 (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \right. \\
 \left. \bar{U}_{f2}^3 \sqrt{(-12 \bar{I}_1 \bar{U}_{f1} - 24 \bar{I}_2 \bar{U}_{f1} - 24 \bar{I}_1 \bar{U}_{f2} - 12 \bar{I}_2 \bar{U}_{f2})^2 - 4 (36 \bar{I}_1^2 - 36 \bar{I}_2^2) (\bar{U}_{f1}^2 - \bar{U}_{f2}^2)} \right) \left. \right\}
 \end{aligned}$$

Obr. 2 Vyjadrenie impedancie a admittancie pre vedenie 400 kV

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In[24]:= Row1 =  $\bar{U}_{f2} * \bar{Y} + \bar{I}_2 * (1 + \bar{Y} * \bar{Z}) - \bar{I}_1$ 
Out[24]=  $-\bar{I}_1 + (1 + \bar{Y} \bar{Z}) \bar{I}_2 + \bar{Y} \bar{U}_{f2}$ 

In[23]:=  $-\bar{I}_1 + (1 + \bar{Y} \bar{Z}) \bar{I}_2 + \bar{Y} \bar{U}_{f2}$ 
Out[23]=  $-\bar{I}_1 + (1 + \bar{Y} \bar{Z}) \bar{I}_2 + \bar{Y} \bar{U}_{f2}$ 

In[22]:= Row2 =  $\bar{U}_{f2} + \bar{I}_2 * \bar{Z} - \bar{U}_{f1}$ 
Out[22]=  $\bar{Z} \bar{I}_2 - \bar{U}_{f1} + \bar{U}_{f2}$ 

In[19]:= Solve[{Row1 == 0, Row2 == 0}, {Y, Z}]
Out[19]=  $\left\{ \left\{ \bar{Y} \rightarrow \frac{\bar{I}_1 - \bar{I}_2}{\bar{U}_{f1}}, \bar{Z} \rightarrow \frac{\bar{U}_{f1} - \bar{U}_{f2}}{\bar{I}_2} \right\} \right\}$ 

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Obr. 3 Vyjadrenie impedancie a admitancie pre vedenie 110 a 22 kV

Zadané hodnoty - vedenie 400 kV (L1)

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Uf1 = 239.9426 * Exp [I * 0 * Degree]
Uf2 = 214.4031 * Exp [I * 24.7088 * Degree]
I1 = 2.18393 * Exp [I * 21.5592 * Degree]
I2 = 2.184518 * Exp [I * 24.26 * Degree]

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239.943

194.773 + 89.6219 i

2.03114 + 0.802512 i

1.9916 + 0.89757 i

ROV11 = -I1 + Uf2 (Y (1 + (5 Z Y) / 36 + (Z Y) ^ 2 / 216)) + I2 (1 + (Y Z) / 2 + (Z Y) ^ 2 / 36)

$(-2.03114 - 0.802512 i) + (194.773 + 89.6219 i) Y \left(1 + \frac{5 Y Z}{36} + \frac{Y^2 Z^2}{216}\right) + (1.9916 + 0.89757 i) \left(1 + \frac{Y Z}{2} + \frac{Y^2 Z^2}{36}\right)$

ROV12 = -Uf1 + Uf2 (1 + (Y Z) / 2 + (Z Y) ^ 2 / 36) + I2 (Z (1 + (Y Z) / 6))

$-239.943 + (1.9916 + 0.89757 i) Z \left(1 + \frac{Y Z}{6}\right) + (194.773 + 89.6219 i) \left(1 + \frac{Y Z}{2} + \frac{Y^2 Z^2}{36}\right)$

riesenie = Solve[{ROV11 == 0, ROV12 == 0}, {Y, Z}]

Solve::ratnz: Solve was unable to solve the system with inexact coefficients. The answer was obtained by solving a corresponding exact

{Y -> 0.0000875117 - 0.000454487 i, Z -> 3.05079 - 45.7808 i}, {Y -> 0.0520815 + 0.783337 i, Z -> -1.51246

Y1 = riesenie[[1, 1, 2]]

Y2 = riesenie[[2, 1, 2]]

Z1 = riesenie[[1, 2, 2]]

Z2 = riesenie[[2, 2, 2]]

0.0000875117 - 0.000454487 i

0.0520815 + 0.783337 i

3.05079 - 45.7808 i

-1.51246 + 22.8518 i

Admitancia

List[Abs[Y1], Arg[Y1] * (180 / Pi)]

{0.000462835, -79.101}

List[Abs[Y2], Arg[Y2] * (180 / Pi)]

{0.785067, 86.1962}

Impedancia

List[Abs[Z1], Arg[Z1] * (180 / Pi)]

{45.8823, -86.1875}

List[Abs[Z2], Arg[Z2] * (180 / Pi)]

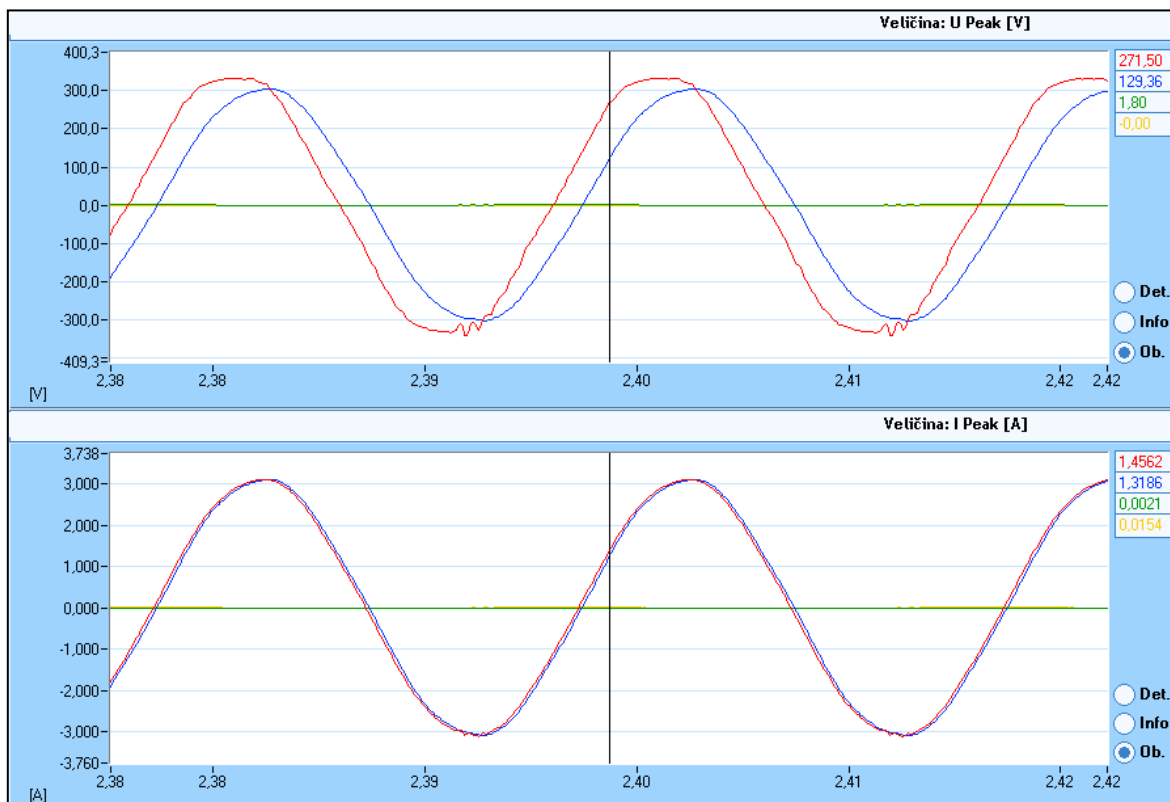
{22.9018, 93.7866}

Obr. 4 Vzorový výpočet impedancie a admitancie pre vedenie 400 kV

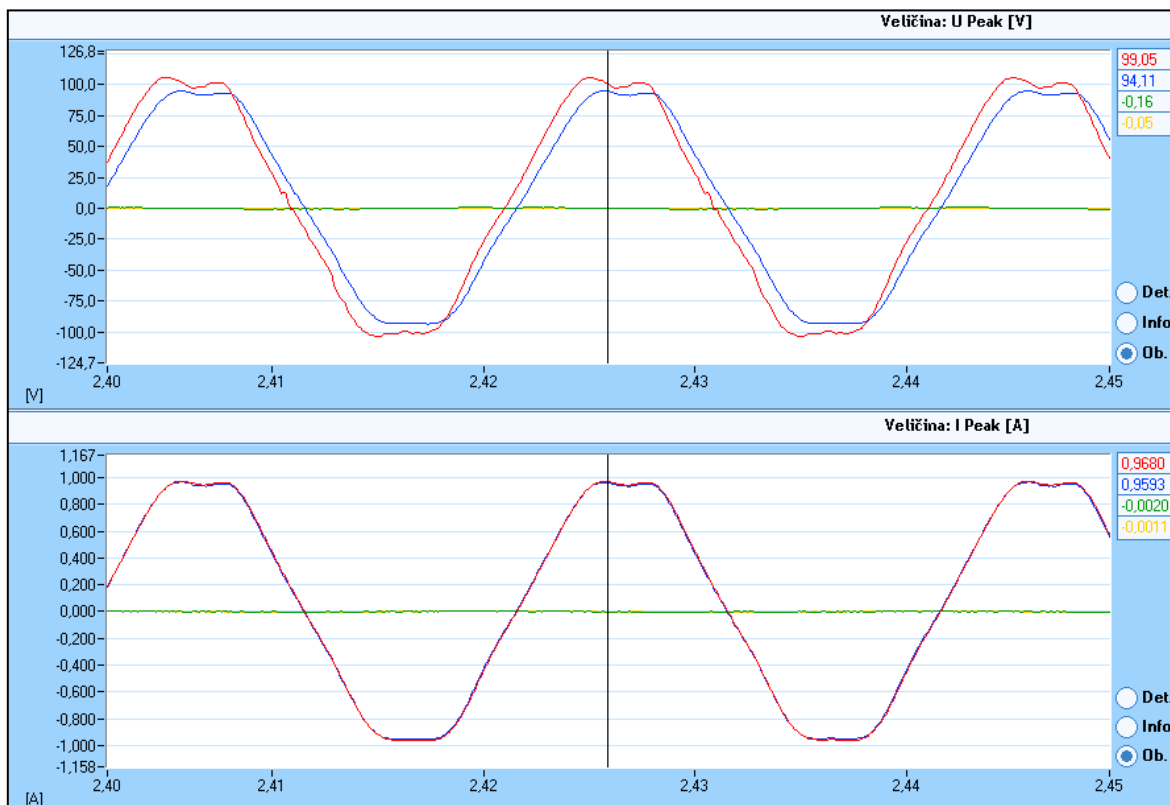
Zadané hodnoty - vedenie 110 kV (L2)	Zadané hodnoty - vedenie 22 kV (L3)
<p>In[25]=</p> <pre> Uf11 = 75.948 * Exp [I * 0 * Degree] Uf22 = 69.292 * Exp [I * 10.432 * Degree] I11 = 0.7127 * Exp [I * 10.321 * Degree] I22 = 0.7069 * Exp [I * 9.7749 * Degree] </pre>	<p>In[1]=</p> <pre> Uf11 = 148.207 * Exp [I * 0 * Degree] Uf22 = 144.261 * Exp [I * 5.246 * Degree] I11 = 1.3615 * Exp [I * 5.1155 * Degree] I22 = 1.3433 * Exp [I * 4.5538 * Degree] </pre>
<p>Out[25]= 75.948</p> <p>Out[26]= 68.1466 + 12.5466 ĩ</p> <p>Out[27]= 0.701168 + 0.127689 ĩ</p> <p>Out[28]= 0.696637 + 0.120016 ĩ</p>	<p>Out[1]= 148.207</p> <p>Out[2]= 143.657 + 13.1901 ĩ</p> <p>Out[3]= 1.35608 + 0.121396 ĩ</p> <p>Out[4]= 1.33906 + 0.106652 ĩ</p>
<p>In[29]= ROV13 = Uf22 YY + I22 (1 + YY ZZ) - I11</p> <p>Out[29]= (-0.701168 - 0.127689 ĩ) + (68.1466 + 12.5466 ĩ) YY + (0.696637</p>	<p>In[5]= ROV13 = Uf22 YY + I22 (1 + YY ZZ) - I11</p> <p>Out[5]= (-1.35608 - 0.121396 ĩ) + (143.657 + 13.1901 ĩ) YY + (1.33906 + 0.</p>
<p>In[30]= ROV14 = Uf22 + I22 ZZ - Uf11</p> <p>Out[30]= (-7.80136 + 12.5466 ĩ) + (0.696637 + 0.120016 ĩ) ZZ</p>	<p>In[6]= ROV14 = Uf22 + I22 ZZ - Uf11</p> <p>Out[6]= (-4.55026 + 13.1901 ĩ) + (1.33906 + 0.106652 ĩ) ZZ</p>
<p>In[31]= riesenie = Solve[{ROV13 == 0, ROV14 == 0}, {YY, ZZ}]</p> <p>Solve::ratnz : Solve was unable to solve the system with inexact coefficients. The an</p> <p>Out[31]= {{YY → 0.0000596543 + 0.000101035 ĩ, ZZ → 7.86246 - 19.3648 ĩ}}</p>	<p>In[7]= riesenie = Solve[{ROV13 == 0, ROV14 == 0}, {YY, ZZ}]</p> <p>Solve::ratnz : Solve was unable to solve the system with inexact coefficients. The an</p> <p>Out[7]= {{YY → 0.000114823 + 0.0000994888 ĩ, ZZ → 2.59709 - 10.0571 ĩ}}</p>
<p>In[32]= YY = riesenie[[1, 1, 2]]</p> <p>ZZ = riesenie[[1, 2, 2]]</p> <p>Out[32]= 0.0000596543 + 0.000101035 ĩ</p> <p>Out[33]= 7.86246 - 19.3648 ĩ</p>	<p>In[8]= YY = riesenie[[1, 1, 2]]</p> <p>ZZ = riesenie[[1, 2, 2]]</p> <p>Out[8]= 0.000114823 + 0.0000994888 ĩ</p> <p>Out[9]= 2.59709 - 10.0571 ĩ</p>
Admitancia	Admitancia
<p>In[34]= List[Abs[YY] * 10^6, Arg[YY] * (180 / Pi)]</p> <p>Out[34]= {117.332, 59.4411}</p>	<p>In[10]= List[Abs[YY] * 10^6, Arg[YY] * (180 / Pi)]</p> <p>Out[10]= {151.929, 40.9073}</p>
Impedancia	Impedancia
<p>In[35]= List[Abs[ZZ], Arg[ZZ] * (180 / Pi)]</p> <p>Out[35]= {20.9, -67.9019}</p>	<p>In[12]= List[Abs[ZZ], Arg[ZZ] * (180 / Pi)]</p> <p>Out[12]= {10.387, -75.5206}</p>

Obr. 5 Vzorový výpočet impedancie a admitancie pre vedenia 110 a 22 kV

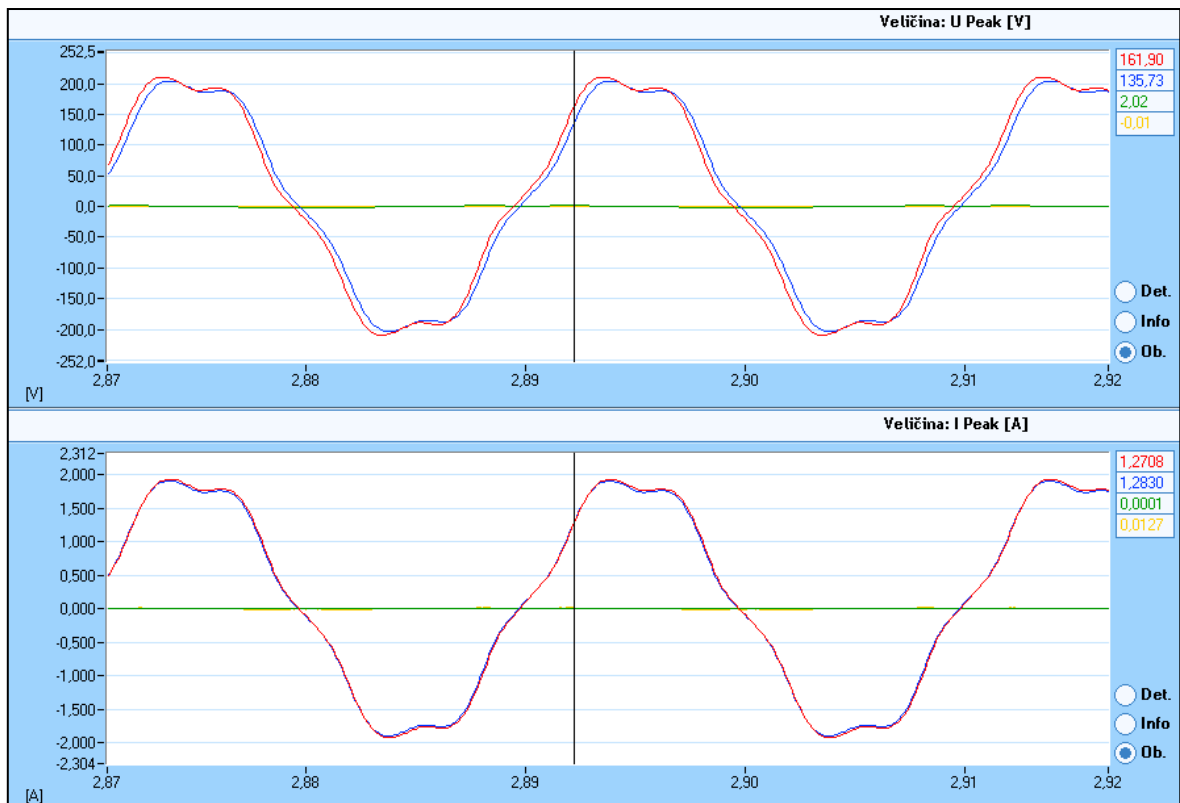
Príloha č. 3: Grafické zobrazenie signálov v čase



Obr. 6 Časový priebeh signálu vedenia 400 kV pre fázu L1



Obr. 7 Časový priebeh signálu vedenia 110 kV pre fázu L2



Obr. 8 Časový priebeh signálu vedenia 22 kV pre fázu L3