

Model transformatoru 2021

Purpose

Model transformátoru pro cvičení KEE/PJS.

Description

Testování modelu sestaveného rovnicemi v chodu nakrátko.

System Parameters

$$\begin{aligned}U_n &= 110 \cdot 10^3 && [\text{V}] \\f &= 50 && [\text{Hz}] \\S_n &= 10 \cdot 10^6 && [\text{VA}] \\u_K &= 10 && [\%] \\i_0 &= 1 && [\%] \\\Delta P_K &= 1 && [\%] \quad \text{dPk} = \text{dPcu} \\\Delta P_0 &= 0.3 && [\%] \quad \text{dP0} = \text{dPfe}\end{aligned}$$

Data

```
*: Model transformatoru 2021
*SYSTEM;

SYSVAR I1, I2;

: Obecne parametry
Un=110E3;      :: [V]
Um=Un/sqrt(3)*sqrt(2);
f=50;         :: [Hz]
Omega=2pi*f;

: Parametry transformatoru
Sn=10E6;      :: [VA]

: Nasledujici parametry zadany v procentech

Uk=10;        :: [%]
I0=1;         :: [%]
dPk=1;        :: [%] dPk = dPcu
dP0=0.3;      :: [%] dP0 = dPfe
dPcu=dPk;
dPfe=dP0;

: Odvozene parametry nahradniho schematu
Rk=(dPk/100)*(Un*Un/Sn);
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Zk=(Uk/100)*(Un*Un/Sn);
Xs=sqrt(Zk*Zk-Rk*Rk);
Ls=Xs/Omega;
Gfe=(dP0/100)*(Sn/(Un*Un));
Rfe=1/Gfe;
Yg=(I0/100)*(Sn/(Un*Un));
Xh=1/sqrt(Yg*Yg-Gfe*Gfe);
Lh=Xh/Omega;

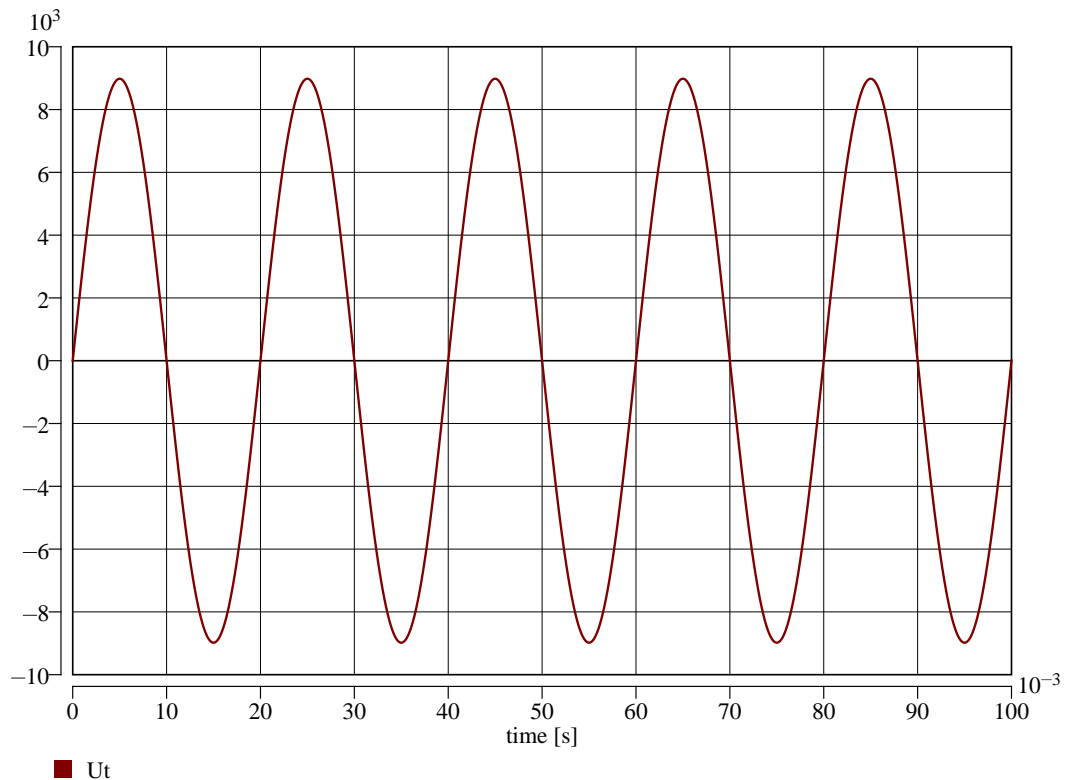
Ut=Uk/100*Um*sin(Omega*TIME);

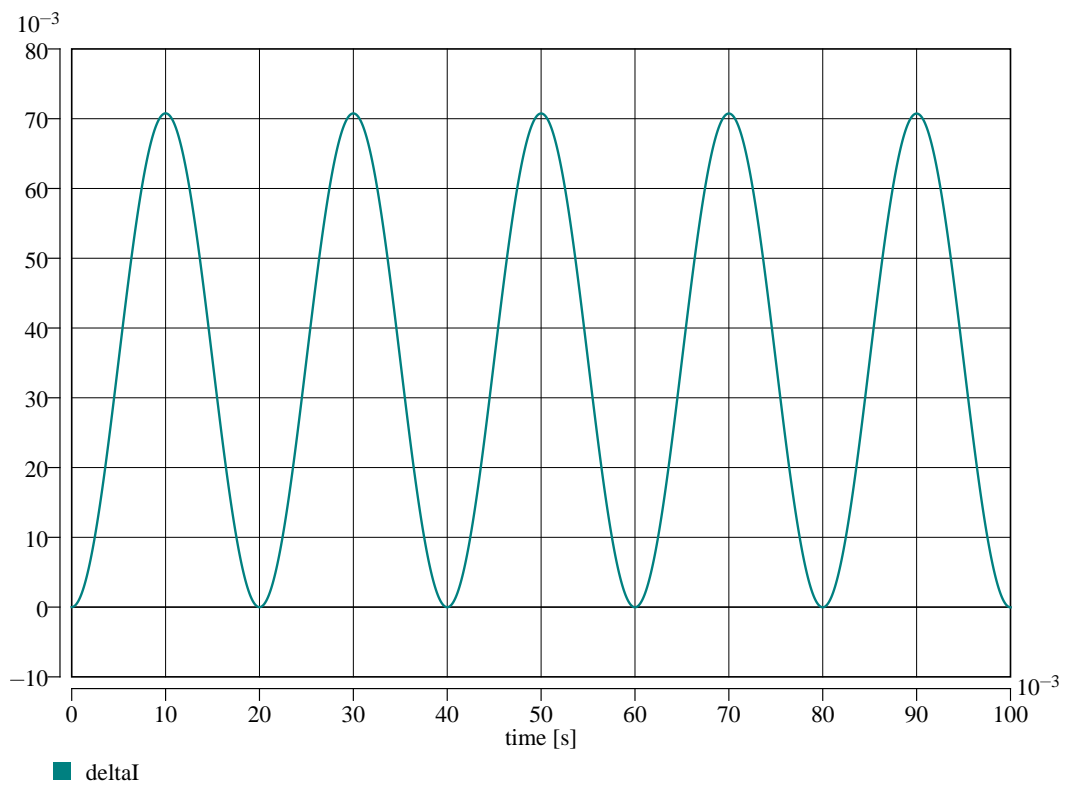
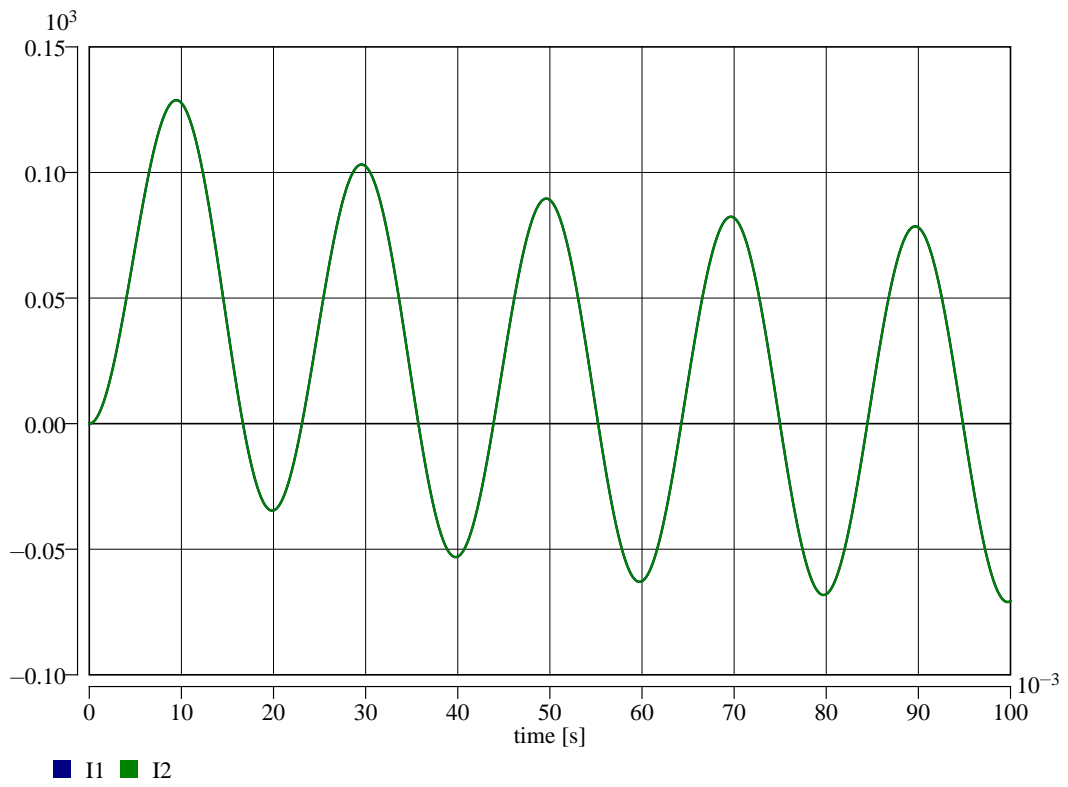
: 0=Ls/2*I1'+I1*Rk/2+Lh*I1'-Lh*I2'-Ut;
: 0=-Lh*I1'+Lh*I2'+Ls/2*I2'+I2*Rk/2;
0=Ls/2*VD.I1+I1*Rk/2+Lh*VD.I1-Lh*VD.I2-Ut;
0=-Lh*VD.I1+Lh*VD.I2+Ls/2*VD.I2+I2*Rk/2;

deltaI=I1-I2;

*TR;
TR 0 0.1;
PRINT(1001) I1, I2, Ut, deltaI;
INIT I1=0, I2=0;
RUN;
*END;

```





Origin

Karel Nohá , KEE, FEL, Z U v Plzni

Last Update

November 7, 2021