

Jednoduchý model stability alternátoru

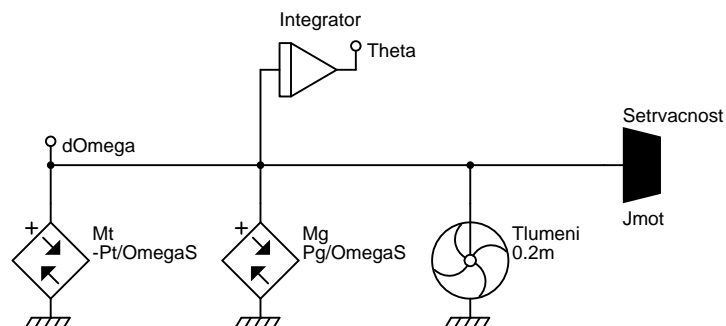
Description

Jednoduchý model stability alternátoru s direktivní regulací buzení a turbíny doplněný tlumením.

System Parameters

$P_{max1} = 227.87$	[MW]	Maximalni cinny vykon alternatoru v predporuchovem stavu
$P_{max2} = 29.01$	[MW]	Maximalni cinny vykon alternatoru v dobe poruchy
$P_{max3} = 205.59$	[MW]	Maximalni cinny vykon alternatoru v dobe odpojeni poruchy
$C_{asPoruchy} = 1$	[s]	Cas vzniku poruchy
$C_{asVypnuti} = 1.5$	[s]	Cas vypnuti poruchy
$T_{buz} = 0.3$	[s]	Casova konstanta regulace buzeni
$P_{t0} = 60$	[MW]	Pocatecni vykon turbiny
$T_{tur} = 10$	[s]	Casova konstanta regulace turbiny
$\omega_S = 100\pi$	[rad/s]	Synchronni uhlova rychlost soustroji
$T_m = 5$	[s]	Mechanicka casova konstanta soustroji
$S_{ng} = 100$	[MVA]	Jmenovity zdanlivy vykon alternatoru

Model



Data

*: Jednoduchý model stability alternátoru

*SYSTEM;

Pmax1=227.87; :: [MW] Maximalni cinny vykon alternatoru v predporuchovem stavu

Pmax2= 29.01; :: [MW] Maximalni cinny vykon alternatoru v dobe poruchy

Pmax3=205.59; :: [MW] Maximalni cinny vykon alternatoru v dobe odpojeni poruchy

CasPoruchy=1; :: [s] Cas vzniku poruchy

CasVypnuti=1.5; :: [s] Cas vypnuti poruchy

: Regulace buzeni

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Tbuz=0.3;          :: [s] Casova konstanta regulace buzeni
RegBuzeni=1+(TIME>=CasPoruchy)*(1-EXP(-(TIME-CasPoruchy)/Tbuz))*1.5;
:: [-] Pomerna hodnota regulace buzeni

: Vykon alternatoru
Pg=RegBuzeni*
  ((TIME< CasPoruchy)*Pmax1*SIN(Theta)+
  (TIME>=CasPoruchy)*(TIME<CasVypnuti)*Pmax2*SIN(Theta)+
  (TIME>=CasVypnuti)*Pmax3*SIN(Theta));
:: [MW] Cinny elektricky vykon alternatoru

: Vykon turbiny
Pt0=60;          :: [MW] Pocatecni vykon turbiny
Ttur=10;         :: [s] Casova konstanta regulace turbiny
RegTurbiny=1-(TIME>=CasPoruchy)*(1-EXP(-(TIME-CasPoruchy)/Ttur))*0.9; :: [-] Pomerna hodnota
regulace turbiny
Pt=RegTurbiny*Pt0; :: [MW] Mechanicky vykon turbiny

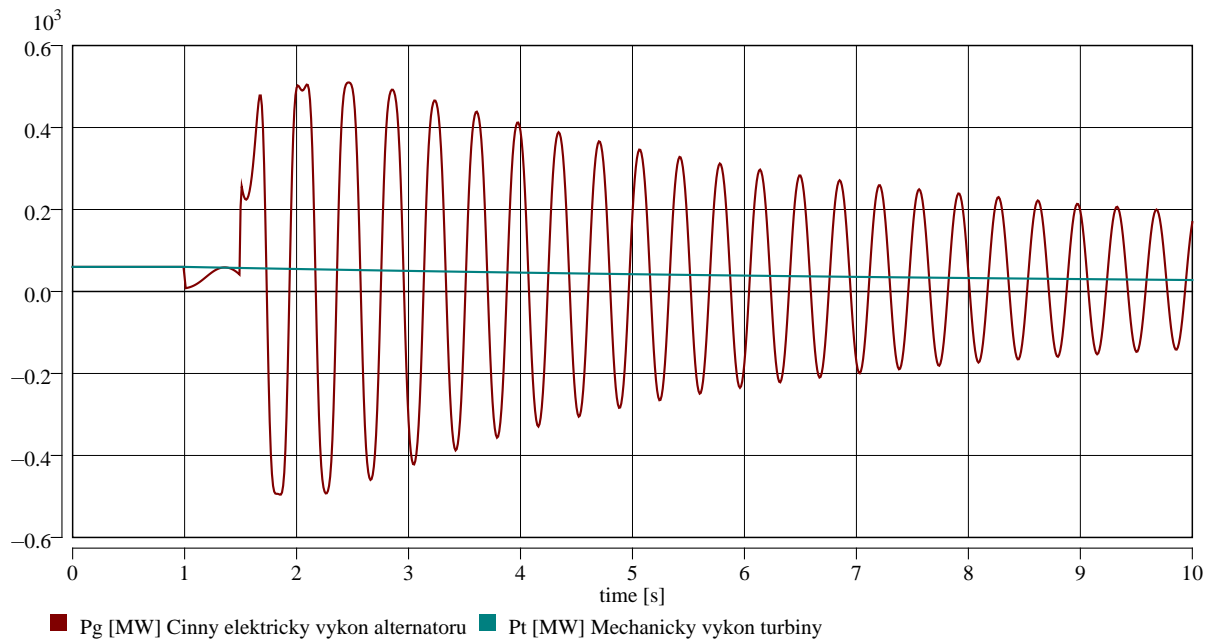
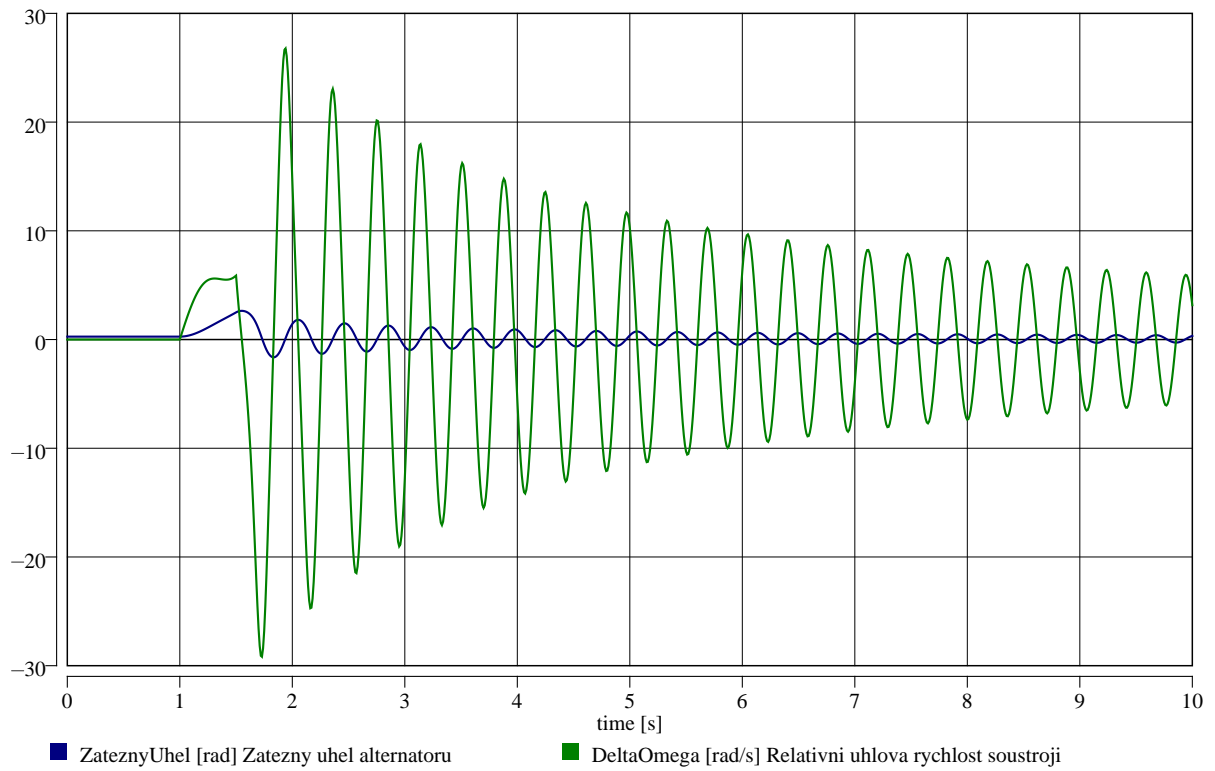
OmegaS=100pi;   ::[rad/s] Synchronni uhlova rychlost soustroji
Tm=5;           ::[s] Mechanicka casova konstanta soustroji
Sng=100;        ::[MVA] Jmenovity zdanlivy vykon alternatoru
Jmot=Tm*Sng/(OmegaS*OmegaS);

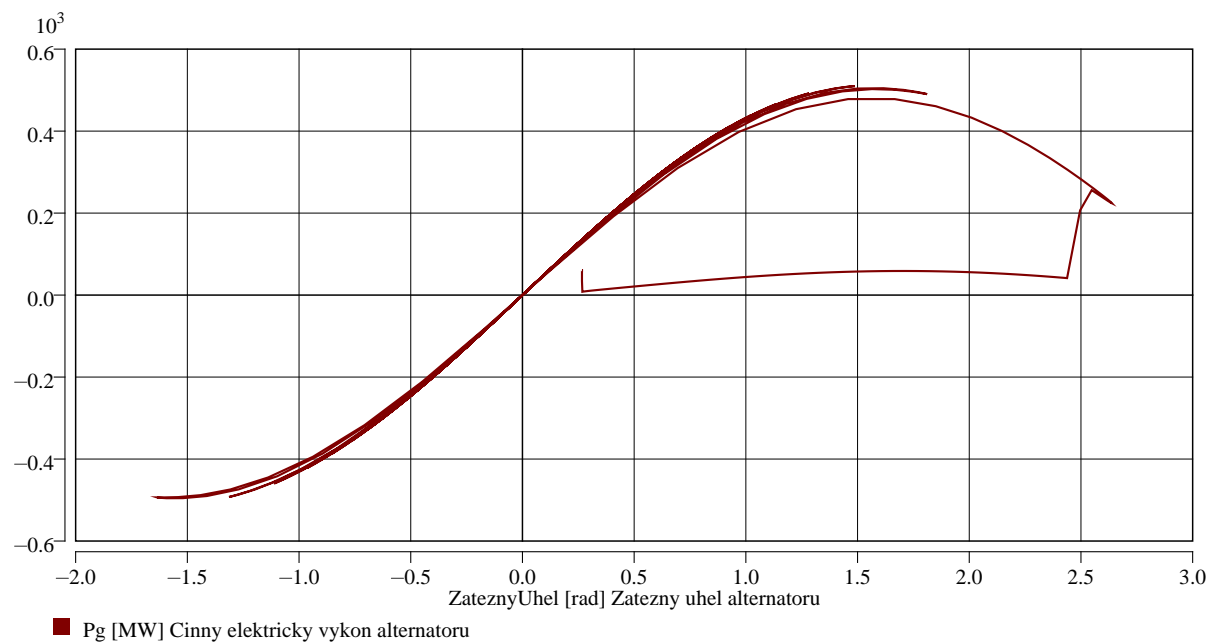
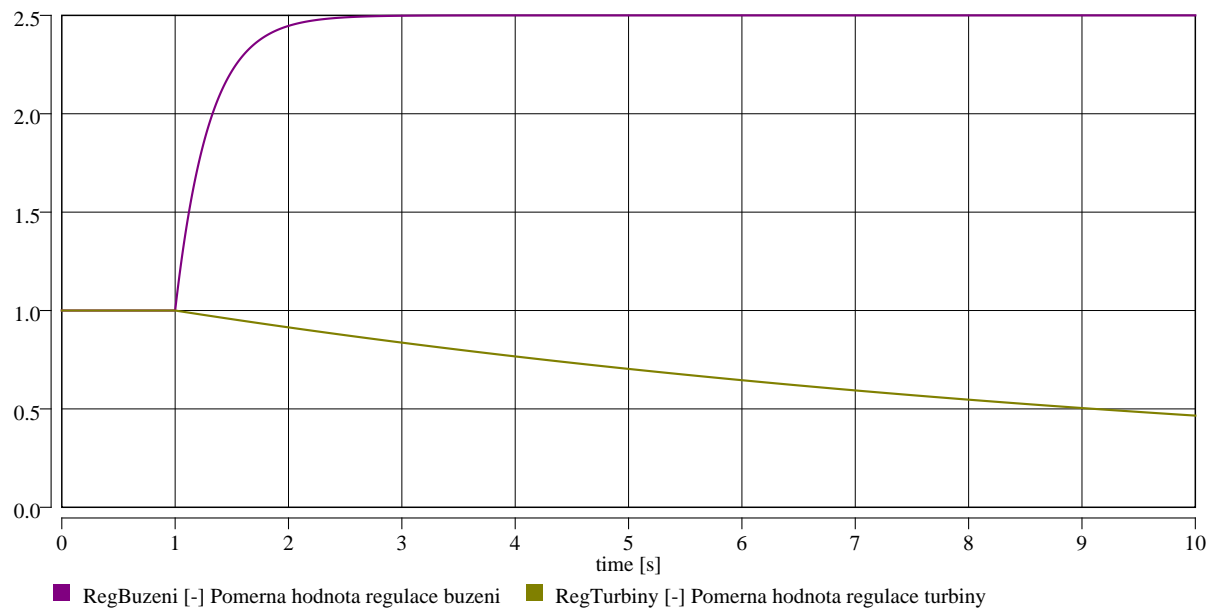
: Pohybove rovnice soustroji
Mt > J dOmega = -Pt/OmegaS;
Mg > J dOmega = Pg/OmegaS;
Setrvacnost > C dOmega = Jmot;
Tlumeni > @fan dOmega,0 / 0.2m;
Integrator > @Int dOmega,Theta;

DeltaOmega=dOmega; :: [rad/s] Relativni uhlova rychlost soustroji
ZateznyUhel=Theta; :: [rad] Zatezny uhel alternatoru

*TR;
TR 0 10;
PRINT(1001) ZateznyUhel, DeltaOmega, Pg, Pt,
  RegBuzeni, RegTurbiny;
INIT Theta=0.26645;
RUN;
*END;

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Origin

Karel Nohac, KEE, FEL, ZCU v Plzni

Last Update

December 22, 2017