

Jednoduchý model stability alternátoru

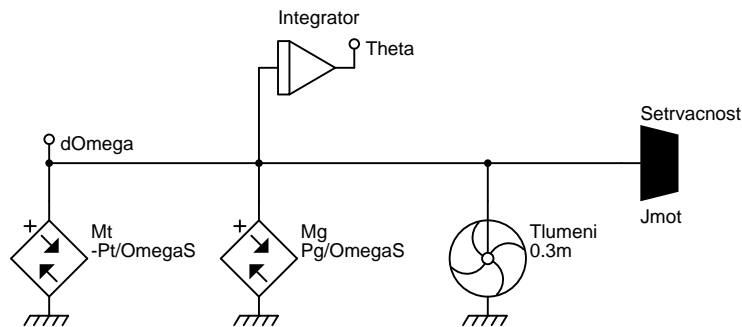
Description

Jednoduchý model stability alternátoru s direktivní regulací buzení a turbíny.

System Parameters

| | | |
|-----------------------|---------|---|
| $P_{max1} = 488.53$ | [MW] | Maximalni cinny vykon alternatoru v predporuchovem stavu |
| $P_{max2} = 66.767$ | [MW] | Maximalni cinny vykon alternatoru v dobe poruchy |
| $P_{max3} = 431.61$ | [MW] | Maximalni cinny vykon alternatoru v dobe odpojeni poruchy |
| $C_{asPoruchy} = 1$ | [s] | Cas vzniku poruchy |
| $C_{asVypnuti} = 1.3$ | [s] | Cas vypnuti poruchy |
| $T_{buz} = 0.3$ | [s] | Casova konstanta regulace buzeni |
| $P_{t0} = 180$ | [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 |
| $S_{ng} = 250$ | [MVA] | Jmenovity zdanlivy vykon alternatoru |

Model



Data

*: Jednoduchý model stability alternátoru

*SYSTEM;

Pmax1=488.53; :: [MW] Maximalni cinny vykon alternatoru v predporuchovem stavu

Pmax2=66.767; :: [MW] Maximalni cinny vykon alternatoru v dobe poruchy

Pmax3=431.61; :: [MW] Maximalni cinny vykon alternatoru v dobe odpojeni poruchy

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

CasVypnuti=1.3; :: [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=180;          :: [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

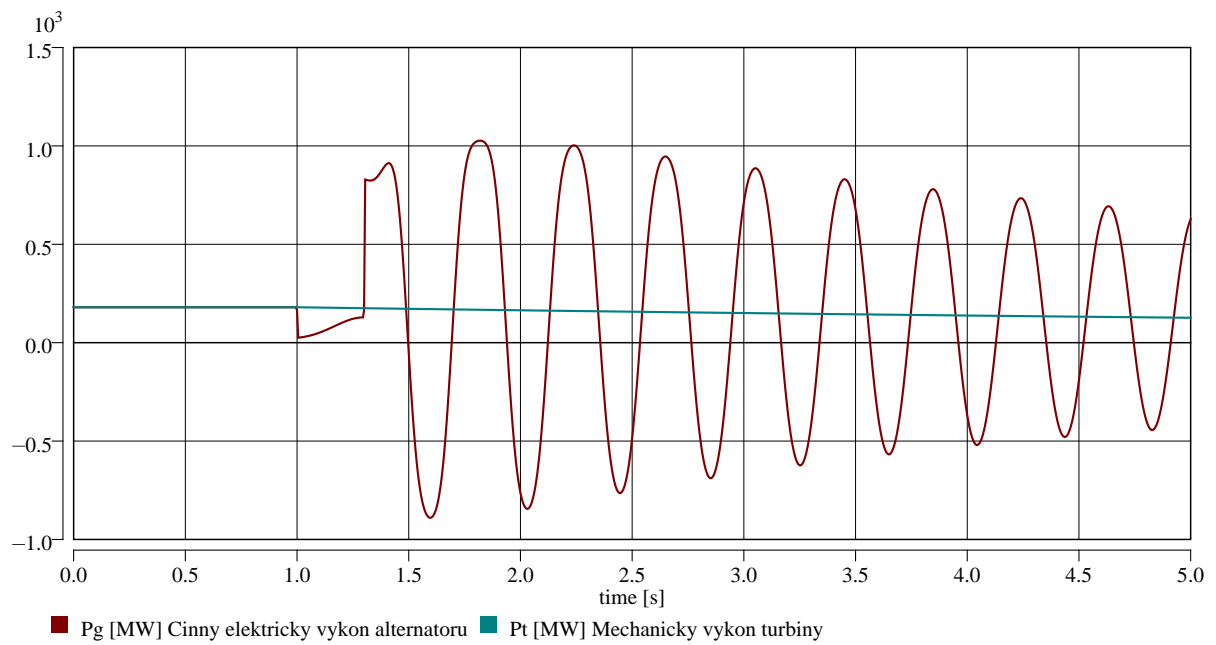
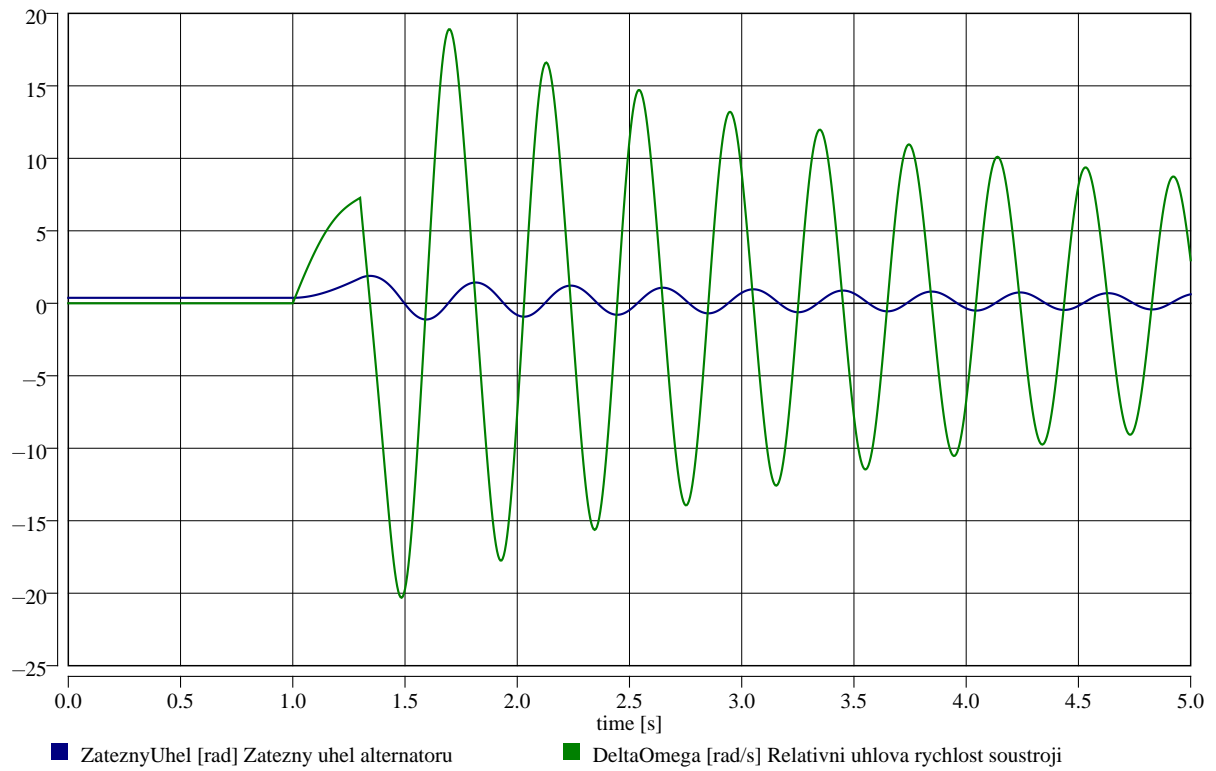
OmegaS=100pi;    ::[rad/s] Synchronni uhlova rychlost soustroji
Tm=5;            ::[s]      Mechanicka casova konstanta soustroji
Sng=250;         ::[MVA]   Jmenovity zdanlivy vykon alternatoru
Jmot=Tm*Sng/(OmegaS*OmegaS);

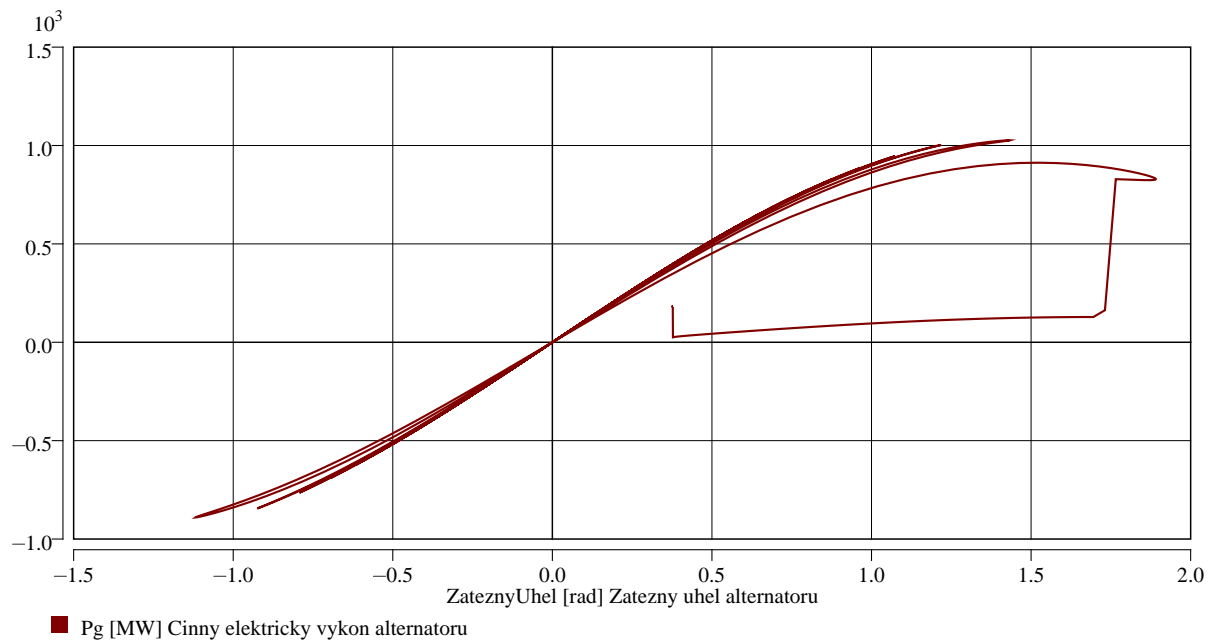
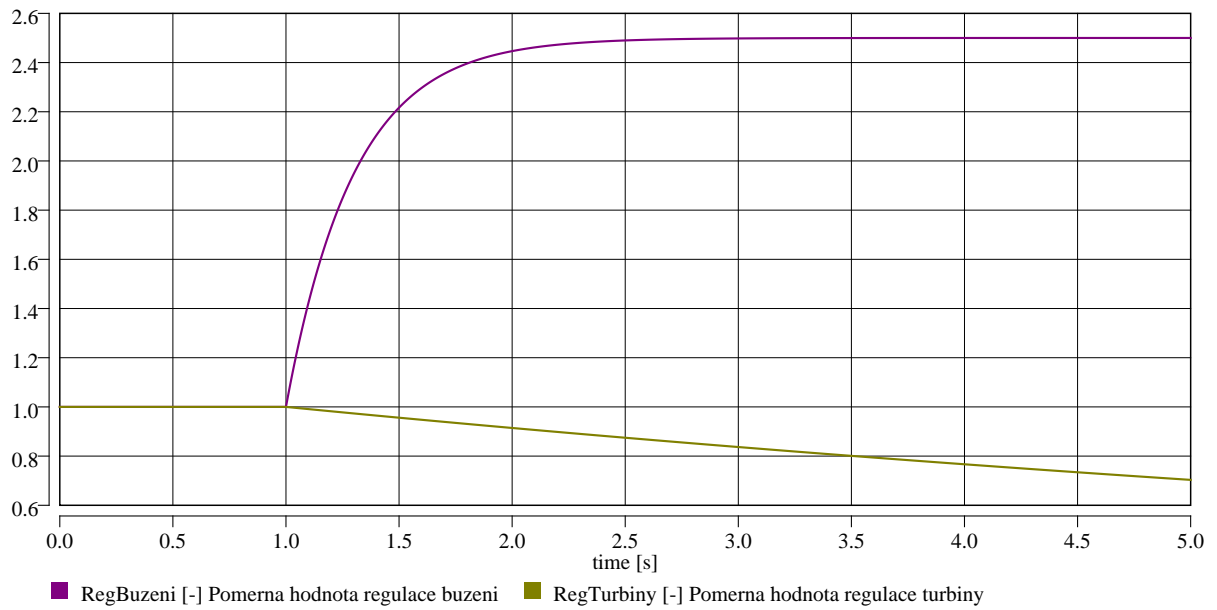
: Pohybove rovnice soustroji
Mt > J dOmega = -Pt/OmegaS;
Mg > J dOmega = Pg/OmegaS;
Setrvacnost > C dOmega = Jmot;
Integrator > @Int dOmega,Theta;

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

Tlumeni > @fan dOmega,0 / 0.6m;
*TR;
TR 0 5;
PRINT(1001) ZateznyUhel, DeltaOmega, Pg, Pt,
  RegBuzeni, RegTurbiny;
INIT Theta=0.37734;
RUN;
*END;

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Origin

Karel Nohac, KEE, FEL, ZCU v Plzni

Last Update

December 17, 2018