

Jednoduchý model stability alternátoru

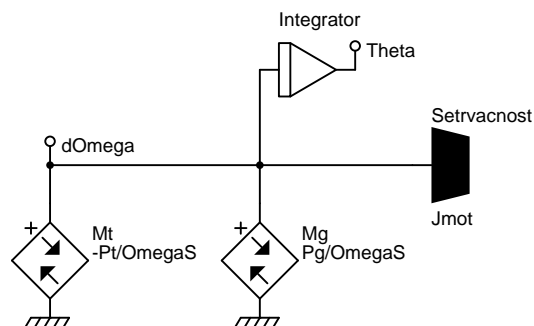
Description

Jednoduchý model stability alternátoru s direktivní regulací buzení a turbíny.

System Parameters

| | | |
|-----------------------|---------|---|
| $P_{max1} = 69.2820$ | [MW] | Maximalni cinny vykon alternatoru v predporuchovem stavu |
| $P_{max2} = 8.8191$ | [MW] | Maximalni cinny vykon alternatoru v dobe poruchy |
| $P_{max3} = 62.5083$ | [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 |
| $P_{t0} = 60$ | [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=69.2820; :: [MW] Maximalni cinny vykon alternatoru v predporuchovem stavu

Pmax2= 8.8191; :: [MW] Maximalni cinny vykon alternatoru v dobe poruchy

Pmax3=62.5083; :: [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=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

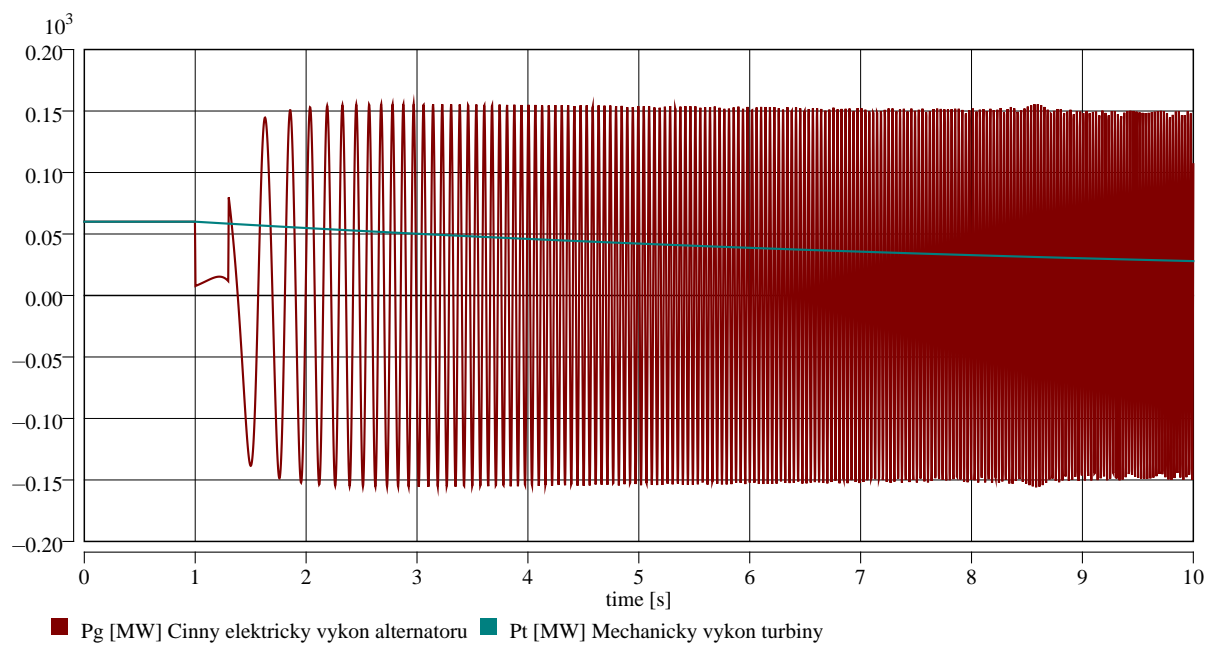
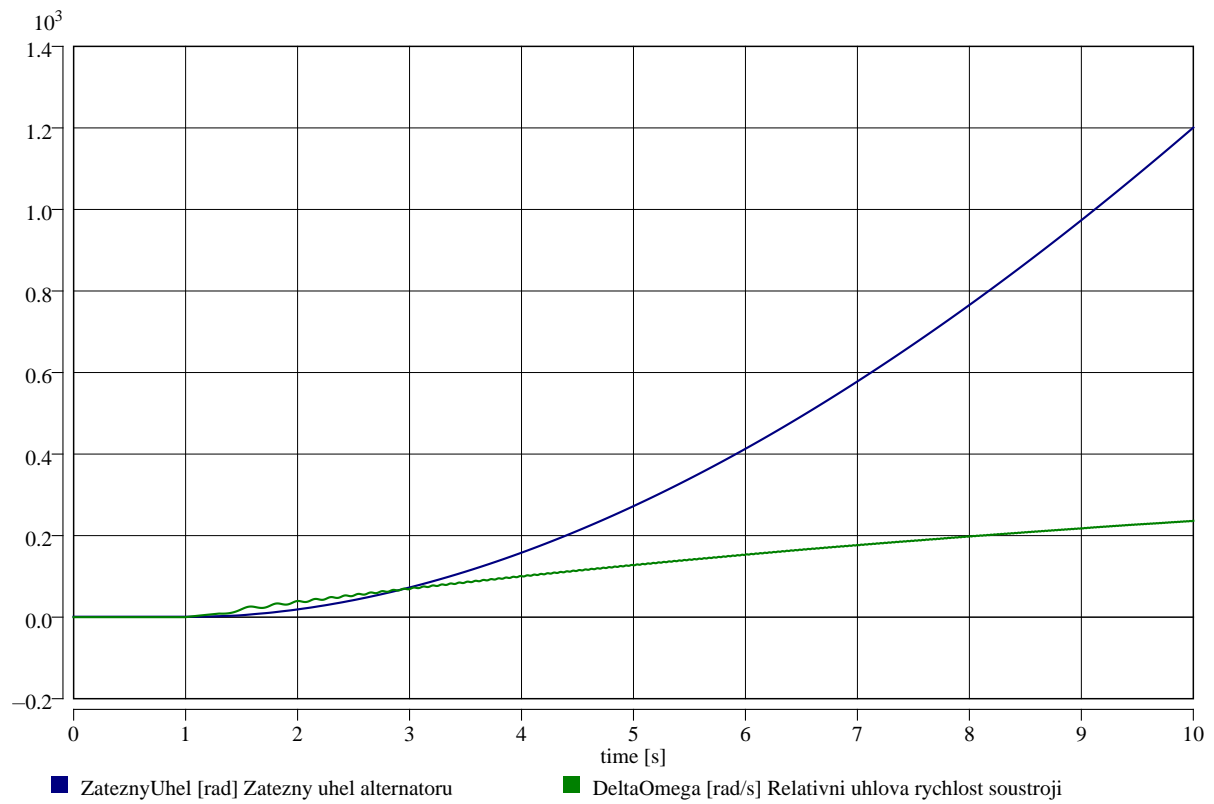
OmegaS=100pi; ::[rad/s] Synchronni uhlova rychlost soustroji
Tm=5;           ::[s] Mechanicka casova konstanta soustroji
Sng=100;        ::[MVA] Jmenovity zdanlivy vykon alternatoru
Jmot=Tm*Sng/(OmegaS*OmegaS);

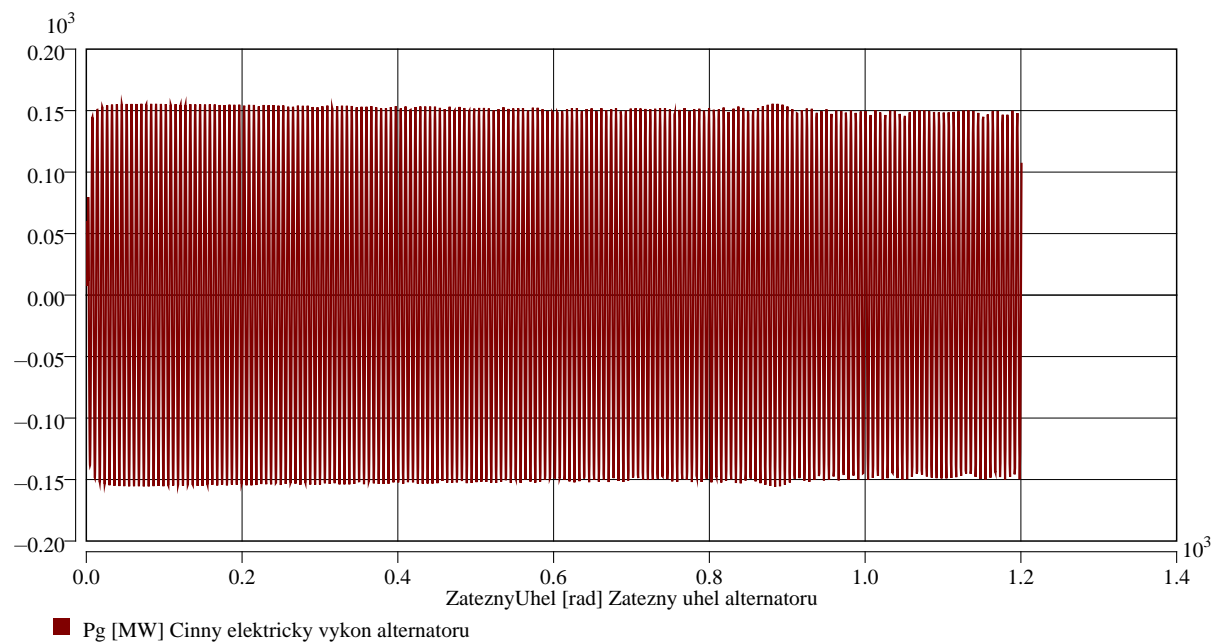
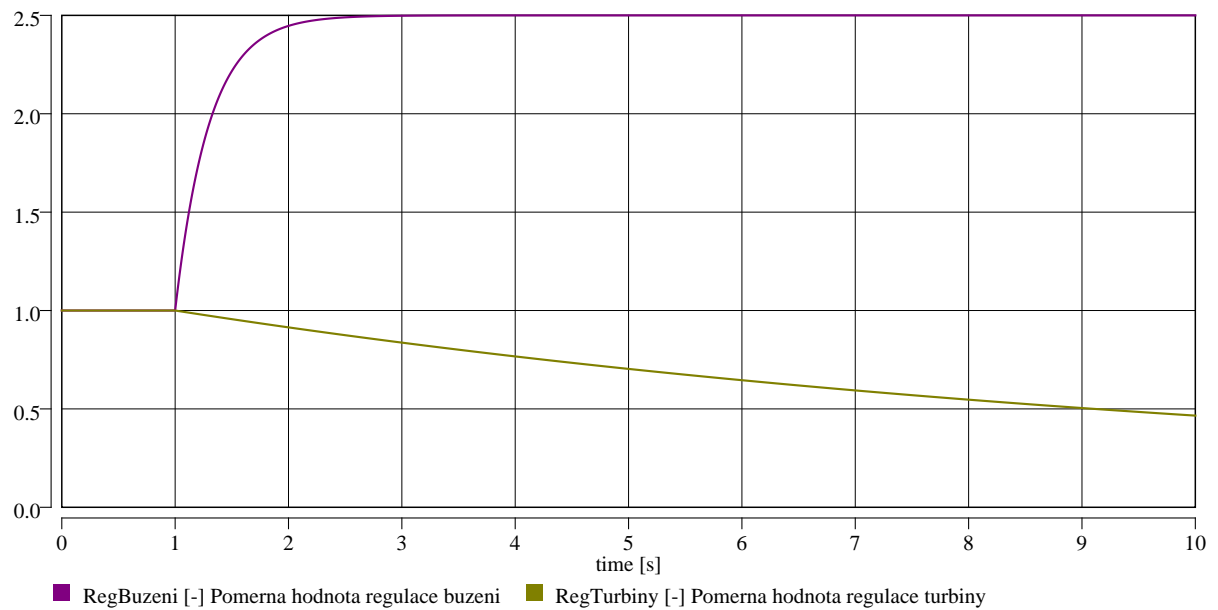
: Pohybove rovnice soustroji
Mt > J dOmega = -Pt/OmegaS;
Mg > J dOmega = Pg/OmegaS;
Setrvacnost > C dOmega = Jmot;
Integrator > @Int dOmega,Theta;

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

*TR;
TR 0 10;
PRINT(4001) ZateznyUhel, DeltaOmega, Pg, Pt,
  RegBuzeni, RegTurbiny;
INIT Theta=1.047197;
RUN;
*END;

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Origin

Karel Nohac, KEE, FEL, ZCU v Plzni

Last Update

December 21, 2017