

bldc1.ece

Attributes

```
mainnodes: a b c
main_var:
+ ia ib ic
+ e_a e_b e_c
+ e0_a e0_b e0_c
+ we wm tem tl
iparms:
+ poles=6
sparms:
rparms:
+ rs=0.98
+ ls=8.035m
+ j=21e-4
+ ke=0.5637
+ b_damp=0
+ b_damp=0
```

Description

bldc1.ece is a brushless DC machine model satisfying the following equations.

$$L_s \frac{di_a}{dt} = V_a - R_s i_a - E_a ,$$

$$L_s \frac{di_b}{dt} = V_b - R_s i_b - E_b ,$$

$$L_s \frac{di_c}{dt} = V_c - R_s i_c - E_c ,$$

$$E_a = k_e \omega_m E_{0a} ,$$

$$E_b = k_e \omega_m E_{0b} ,$$

$$E_c = k_e \omega_m E_{0c} ,$$

$$\tau_{em} \omega_m = E_a i_a + E_b i_b + E_c i_c ,$$

$$\omega_e = \frac{P}{2} \omega_m ,$$

$$J \frac{d\omega_m}{dt} = \tau_{em} - \tau_L - B_{\text{damp}} \omega_m .$$

AC behaviour is not implemented.