Errata

Dynamic Simulation of Electric Machinery Using Matlab/Simulink, Chee-Mun Ong
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Page	Item	Corrections
35	Eq. 3.10	$-i_1$ should be $-di_1/dt$
36	Eq. 3.12	$-i_1$ should be $-di_1/dt$
59	Eq. 3.93	$q_1 = (C_{11} + C_{12} + \ldots + C_{1(n-1)})V_{1n} - C_{12}V_{12} - \ldots - C_{1(n-1)}V_{1(n-1)}$
142	Eq. 5.65	$\left[T_{\alpha\beta 0}\right] = \frac{2}{3}\begin{bmatrix} 1 & -\frac{1}{2} & -\frac{1}{2} \\ 0 & \frac{\sqrt{3}}{2} & -\frac{\sqrt{3}}{2} \\ \frac{1}{2} & \frac{1}{2} & \frac{1}{2} \end{bmatrix}$
	Eq. 5.66	$\left[T_{\alpha\beta 0}\right]^{-1} = \begin{bmatrix} 1 & 0 & 1 \\ -\frac{1}{2} & \frac{\sqrt{3}}{2} & 1 \\ -\frac{1}{2} & -\frac{\sqrt{3}}{2} & 1 \end{bmatrix}$
176	Eq. 6.33	$L_m = \frac{3}{2}L_{ss} = \frac{3}{2}\frac{N_s}{N_r}L_{sr} = \frac{3}{2}\left(\frac{N_s}{N_r}\right)^2 L_{rr}$
193	Eq. 6.89	$\frac{d\lambda_{qs}^e}{dt} = v_{qs}^e - r_s i_{qs}^e - E_{qs}^{'} - \omega_e L_s^{'} i_{ds}^e$ $\frac{d\lambda_{ds}^e}{dt} = v_{ds}^e - r_s i_{ds}^e - E_{ds}^{'} + \omega_e L_s^{'} i_{qs}^e$
195	Eq. 6.97	$\psi_{aro}^{'} = \frac{\omega_e}{\omega_b}\left(x_{lr}^{'} + x_m\right)\tilde{I}_{aro}^{'} + \frac{\omega_e}{\omega_b}x_m\tilde{I}_{aso}^{'}$ $\psi_{aro}^{'} + \Delta\psi_{ar}^{'} = \frac{\omega_e}{\omega_b}\left(x_{lr}^{'} + x_m\right)\left(\tilde{I}_{aro}^{'} + \Delta\tilde{I}_{ar}^{'}\right) + \frac{\omega_e}{\omega_b}x_m\left(\tilde{I}_{aso}^{'} + \Delta\tilde{I}_{as}^{'}\right)$
	Eq. 6.99	$\tilde{V}_{aso}^{'} + \Delta\tilde{V}_{as}^{'} = \left(r_s + j\frac{\omega_e}{\omega_b}\left(x_{ls} + x_m - \frac{x_m^2}{x_{lr}^{'} + x_m}\right)\right)\left(\tilde{I}_{aso}^{'} + \Delta\tilde{I}_{as}^{'}\right)$ $\mathrm{j}\frac{\omega_e}{\omega_b}\left(\frac{x_m}{x_{lr}^{'} + x_m}\right)\tilde{\psi}_{aro}^{'}$
197	Eq. 6.106	$v_{qs}^s = \frac{2}{3}v_{as} - \frac{1}{3}v_{bs} - \frac{1}{3}v_{cs} = \frac{2}{3}v_{ag} - \frac{1}{3}v_{bg} - \frac{1}{3}v_{cg}$
197	Eq. 6.107	$v_{qr}^{'r} = \frac{2}{3}v_{ar}^{'} - \frac{1}{3}v_{br}^{'} - \frac{1}{3}v_{cr}^{'} = \frac{2}{3}v_{an}^{'} - \frac{1}{3}v_{bn}^{'} - \frac{1}{3}v_{cn}^{'}$

227 Fig. 6.26(c) As shown, T_{em} in engineering units is not consistent with rotor equation in per unit. Use either Eq. 6.120 to change rotor equation to engineering unit, that is replace 1/(2H) by $P/(2J\omega_b)$ or change T_{em} to per unit. Should be done for all project files in Chapter 6 and 9.

248 Fig. 6.39(e) Value of Tfactor has to give a T_{em} in per unit to be consistent.

267 Eq. 7.17 $$\Lambda_{qd0} = \left(T_{qd0} L_{ss} T_{qd0}^{-1} L_{ss}\right) i_{qd0} + \left(T_{qd0} L_{sr}\right) i_r$$

277 Eq. 7.66
$$\boldsymbol{P_{em}} = \Re\left[3\left(\omega_e \boldsymbol{L_d}\vec{\boldsymbol{I}}_{\boldsymbol{d}} + \vec{\boldsymbol{E}}_{\boldsymbol{f}} + \boldsymbol{j}\omega_e \boldsymbol{L_q}\vec{\boldsymbol{I}}_{\boldsymbol{q}}\right)\left(\vec{\boldsymbol{I}}_{\boldsymbol{q}} + \boldsymbol{j}\vec{\boldsymbol{I}}_{\boldsymbol{d}}\right)\right]$$
$$= 3\left\{\vec{\boldsymbol{E}}_{\boldsymbol{f}}\vec{\boldsymbol{I}}_{\boldsymbol{q}} + \omega_e\left(\boldsymbol{L_d} - \boldsymbol{L_q}\right)\vec{\boldsymbol{I}}_{\boldsymbol{d}}\vec{\boldsymbol{I}}_{\boldsymbol{q}}\right\}$$

277 Eq. 7.67 $$T_{em} = \frac{P}{2\omega_e} P_{em} = 3\frac{P}{2\omega_e}\left\{E_f I_q + \omega_e\left(L_d - L_q\right) I_d I_q\right\}$$

278 Eq. 7.68 $$T_{em} = -3\frac{P}{2\omega_e}\left\{\frac{E_f V_a}{X_d}\sin\delta + \frac{V_a^2}{2}\left(\frac{1}{X_q} - \frac{1}{X_d}\right)\sin 2\delta\right\}$$

283 Eq. 7.81 $$i_b = -\frac{1}{2} i_q^s - \frac{\sqrt{3}}{2} i_d^s; \quad i_c = -\frac{1}{2} i_q^s + \frac{\sqrt{3}}{2} i_d^s$$

285-6 Fig 7.10 Eq. 7.75 should be Eq. 7.77 in Fig. 7.10(a) and 7.10(c)

295 Eq. 7.94
$$\Delta\lambda_d^{st} = \lambda_d - \Delta\lambda_d = \lambda_d - L_{md}\Delta i_d = L_{md} i_f^{'}$$
$$\Delta\lambda_q^{st} = \lambda_q - \Delta\lambda_q = \lambda_q - L_{mq}\Delta i_q = L_{mq} i_g^{'}$$

296-7 replace $\Delta\lambda_f$ by $\Delta\lambda_f^{'}$ and $\Delta\lambda_g$ by $\Delta\lambda_g^{'}$

Eq. 7.97 $$\Delta\lambda_f^{'} = L_{md}\Delta i_d + L_{ff}^{'}\Delta i_f^{'}$$

325 Eq. 7.164 $$\psi_0 = \omega_b \int\left(v_o - \frac{r_s}{x_{ls}}\psi_0\right) dt$$

345 Eq. 7.179 $$T_{em} = \frac{3}{2}\frac{P}{2}\left\{\lambda_{md}\left(i_{q1} + i_{q2}^{'}\right) - \lambda_{mq}\left(i_{d1} + i_{d2}^{'}\right)\right\}$$

346 1st para When Eq. 7.180 is written …

347 Eq. 7.184 replace $b_{13}\psi_{q1}$ by $b_{31}\psi_{q1}$

Eq. 7.186 $$\psi_{md} = x_{MD}\left\{\left(b_{21} + b_{41}\right)\psi_{q1} + \left(b_{22} + b_{42}\right)\psi_{d1} + \left(b_{23} + b_{43}\right)\psi_{q2}^{'} + \left(b_{24} + b_{44}\right)\psi_{d2}^{'} + \frac{\psi_{kd}^{'}}{x_{lkd}^{'}} + \frac{\psi_f^{'}}{x_{lf}^{'}}\right\}$$

Eq. 7.187 $$\frac{1}{x_{MD}} = \frac{1}{x_{md}} + \left(b_{22} + b_{24} + b_{42} + b_{44}\right) + \frac{1}{x_{lkd}^{'}} + \frac{1}{x_{lf}^{'}}$$

348 Eq. 7.190 $T_{em} = \frac{3}{2}\frac{P}{2\omega_b}\left\{\psi_{md}\left(i_{q1} + i'_{q2}\right) - \psi_{mq}\left(i_{d1} + i'_{d2}\right)\right\}$

375 Eq. 8.36 replace $L_{aq}^2 / \frac{2}{a} / 2$ by $L_{aq} / \frac{2}{a} / 2$

418 Fig. 9.3 T_{mech} line missing or incomplete

419 Fig. 9.4 T_{mech} line misplaced