indmc.ece

Attributes

```
  mainnodes: a b c n
  outvar:
+    ia=bec(1)_of_im
+    ib=bec(2)_of_im
+    ic=bec(3)_of_im
+    tem=tem_of_im
  main_var: wrm tl
  iparms: poles=4
  rparms:
+   rs=0.435 lls=0.002 lm=0.0693 llr=0.002 rr=0.816
+   j=0.089  wref=0
```

Description

`indmc.ece` is an induction machine with terminals `a`, `b`, `c`, `n`. The integer and real parameters and main variables (`tem` and `tl`) are used to evaluate the model equations reproduced below.

$$
\begin{aligned}
i_{ds} &= \frac{l_r}{l_m l_e}\psi_{ds} - \frac{1}{l_e}\psi_{dr} \ , \\
i_{dr} &= \frac{1}{l_m}\psi_{ds} - (\frac{l_{ls}}{l_m}+1)\ i_{ds} \ , \\
i_{qs} &= \frac{l_r}{l_m l_e}\psi_{qs} - \frac{1}{l_e}\psi_{qr} \ , \\
i_{qr} &= \frac{1}{l_m}\psi_{qs} - (\frac{l_{ls}}{l_m}+1)\ i_{qs} \ , \\
T_{em} &= \frac{3}{4}\ l_m\ (i_{qs} i_{dr} + i_{ds} i_{qr}) \ , \\
\omega_r &= \frac{P}{2}\ \omega_{rm} \ , \\
\dot{\psi}_{ds} &= v_{ds} - r_s i_{ds} \ , \\
\dot{\psi}_{qs} &= v_{qs} - r_s i_{qs} \ , \\
\dot{\psi}_{dr} &= -\ \omega_r \psi_{qr} - r_r i_{dr} \ , \\
\dot{\psi}_{qr} &= \omega_r \psi_{dr} - r_r i_{qr} \ , \\
\dot{\omega}_r &= \frac{P}{2}\ \frac{T_{em} - T_L}{J} \ .
\end{aligned}
$$

The three terminal currents `ia`, `ib`, `ic`, and the electromechanical torque `tem` are made available as output variables.

AC behaviour is not implemented.