

Review of: "Backstepping Control Design in Conjunction with an EKF-based Sensorless Field-Oriented Control of an IPMSM"

Daniel Legrand Mon-Nzongo¹

¹ Concordia University

Potential competing interests: No potential competing interests to declare.

1 where the f matrix should state that it can be voltage, current, flux, etc., instead of just saying that it can be divided into f_a , f_b , f_c 3D matrices

2 VABCs and IABCs should state that they are the stator voltage and current of the ABC three-phase, and it may not be enough to say that they are the stator voltage and current. Does it repeat the description here? Only need to introduce the same physical quantity once.

4 It is not introduced that e_1 is the rotor speed error and x_2 is the q-axis reference.

6 Why does a formula derivation transition change the case of a letter?

7 All formulas should add "where" to describe the physical quantity.

8 Step 6 describes that the conversion of $U_{\alpha\beta}$ to U_{ABC} for PWM is incompatible with the direct use of $U_{\alpha\beta}$ for SVPWM in Figure 2. Figure 2. Is id_{ref} grounded? I think it's good to just write $id_{ref}=0$.

9 The third part is the current controller based on FOC, so I think we should introduce the FOC first and then the controller.

10 This only introduces the meaning that this symbol is the optimal estimate, and the horizontal symbol should be the average.

11 IPMSM L_d is different from L_q .

12 In the simulation, there are only velocity estimate graphs, $i_{\alpha\beta}$ estimate graphs, and we, $IdIq$, motor torque load torque graphs under the experimental condition of $\omega_e=400$, $T=20$ Nm, $t=3$ s. The change in the speed of parameter change stated in the introduction is not reflected. Figure 6 should not be 0-400. Suppose it is 0-200-400. The important thing is 200-400. Parameter change should be stability analysis under parameter mismatch. The high efficiency of EFK is not reflected only in the accuracy. The number of simulation experiments is too small.

