

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

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Potential competing interests: No potential competing interests to declare.

The paper presents an FOC of a PMSM using EKF-based position and speed estimation.

I have the following comments about the paper.

- I am a bit surprised by the content of the paper: on the 38 pages, 9 are dedicated to a very wide bibliographic review; then 11 pages are dedicated to the model of the IPMSM and to the control, which, to my opinion, are well-known. Only then are the observer and simulation results presented (9 pages).
- Several pages present quite generic content: the first 3 pages of the intro explain the well-known advantages of PMSMs over other types of machines. Section 3.2 also presents what can be found in courses on field-oriented control. Such generic content should be summarized to only keep what is necessary to understand what has been done. The objective of a scientific paper is different from the one of a course.
- The novelty of the presented control is neither clearly highlighted nor related to what is presented in the literature review. So the following questions stay in my mind: "Which novelty does this paper present, and what are the advantages compared to what is presented in the literature review?"
- In equation (5), do we consider $L_d = L_q$? The term " $(L_d - L_q) \cdot i_{ds} \cdot i_{qs}$ " from equation (4) seems to have disappeared. In equation (24), there is a unit problem: there should be a constant multiplying the cross product " $B_{stator} \times B_{rotor}$ " to obtain the unit of a torque.
- How were the covariance matrices P_0 , Q , and R determined ? When reading the conclusions, it seems that they were found by trial and error.
- Experimental results would be welcome to confirm the simulation results.

Based on those observations, I am afraid that the level of the paper is too low for publication...