28 April 2022

Subject: Response to Major Revision of JESTIE-22-0034

Dear. Prof. Chandan Chakraborty

Thank you for your letter and the opportunity to revise our paper titled 'Concurrent Wireless Power Transfer and Motor Drive System with a Single Converter'. The revisions offered by the reviewers have been helpful, and we also appreciate your insightful comments. We have included the response to the reviewer comments immediately after this letter. The paper has been improved by the reviewers' comments. The modifications and additions are highlighted in the main text. We deeply appreciate your consideration of our manuscript.

Kind Regards

Dr. Ozan Keysan

Reviewer 1:
This is a solid piece of work that demonstrated that an additional IPT power supply can be added to an existing motor drive system without adding an additional converter. The paper is well written in general, but it would be helpful to clarify the following points in the final revision:

Response: Thank you for your constructive comments. We address your comments and make the required additions to the paper as given below.

1. Is this for a normal DC motor? The output from the FB inverter is supposed to be AC. Although the high frequency AC current is designed to flow in the resonant branch for IPT, and the current in the motor circuit is filtered, it is not clear how the DC current can be determined, or is this for brushless DC motor?

    - **Response:** Yes, the proposed method is applied to a conventional brushed DC motor and the FB converter generates the DC output with high frequency switching harmonics for wireless power transfer. In order to clarify the system and output voltage harmonics, the theory of operation section is expanded. The modifications are highlighted.

2. Many DC motors are driven by a DC voltage source, how to determine the DC voltage to drive the motor?

    - **Response:** Thank you for your comment. The output is adjusted by the duty cycle, with that positive, zero, or negative DC voltages can be obtained. The effect of the duty cycle on the output voltage is now explained in detail in the theory of operation section.

3. The applications of the auxiliary contactless power are not clearly specified, can it be used as the field excitation source of the DC motor? How would different loads affect the system performance?

    - **Response:** Sorry for the confusion. The introduction and conclusions sections are now expanded to give application examples. The control techniques for varying load characteristics are also discussed in the main text.

4. Fig.3 clearly shows the commutator brushes. If mechanical sliding contacts are already there in the system, it is a simpler option to just to use a mechanical slip ring to supply power to the rotating shaft?

    - **Response:** Thank you for the comment. As a proof-of-concept a conventional DC motor is used where the armature current is delivered via commutators, but in order to energize any rotating loads a separate slip ring (not a pole-changing commutator) is required in addition to existing commutator. Furthermore, the proposed methodology can be expanded to AC machines or brushless-DC motor. These issues are not discussed in detail in the main text.

Reviewer 2:

1. If the motor is not working, there would not be power for the IPT system. The motor system is coupled with the IPT system. What would happen if the motor is not working and there is power demand for the IPT system?

    - **Response**: Thank you for the comment. It is possible to control the power of the motor by controlling duty cycle. For example, for a duty cycle of 0.5, it is possible to produce zero voltage for the DC motor while transferring power to the IPT. This power sharing issue is now discussed in detail in the theory of operation and experimental results sections. The modifications are highlighted.

2. The soft switching of the inverter should be analyzed.

    - **Response:** Thank you for the comment. The soft switching conditions are now included in the discussion section.

Reviewer 3:

This is an interesting topic, and I think the paper is easily read. Although I really did not double check the individual equations, I think the flow and the concept are well developed. Also, its performance seems good based on the experimental results. I think this paper can be published in this journal.

Response: Thank you for your precious comments.