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Black Widow Optimization Algorithm: Optimal Designing and modelling and of LLC Resonant Converter

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Erratum

We have done the corrections in the publication, "Black Widow Optimization Algorithm: Optimal Designing and modelling and of LLC Resonant Converter" (https://doi.org/10.46253/jcmps.v3i1.a4), as follows

Section	Paragraph/Line	Published content	Corrected content
1	3rd paragraph 3rd line	The LLC RC erstwhile extensively employed in the server power supply, electric vehicle charger, and UPS circumstances for its benefits, like isolation, high-efficiency soft switching, adjustable voltage, and high switching frequency [5].	The LLC RC erstwhile extensively employed in the server power supply, electric vehicle charger, and UPS circumstances for its benefits, like isolation, high-efficiency soft switching, adjustable voltage, and high switching frequency [5] [21].
1	6th paragraph	Content to be added as 6th paragraph.	This proposed research is building upon the work presented in [21], which provides a detailed mathematical modeling and analysis of the start-up process for LLC resonant converters, this work proposes an enhanced approach in this study. The resonant converter details and mathematical modeling are directly adopted from the paper [21]. However, for the novel contribution, this research replaces the optimization algorithm discussed in [21] with the Black Widow Optimization Algorithm (BWOA). This adjustment allows for a more efficient optimization of critical parameters such as the time constant, start-up time, and output voltage response. Performance analyses are conducted based on this novel approach, demonstrating its effectiveness in improving the LLC resonant converter's performance.
3	6th line	Frequency modulation control is broadly approved also preferred option to carry out clearer the control system and get the measurements in real-time, from exact high frequency f_{st} it decides the switching that mitigates in an exponential otherwise linear pattern to steady-state frequency f_r, that is $f = f_r + (f_{st} - f_r)e^{\frac{-t}{\tau}}$ as demonstrated in Fig. 1, whereas τ indicates frequency time constant and t indicates time.	Frequency modulation control is broadly approved also preferred option to carry out clearer the control system and get the measurements in real-time, from exact high frequency f_{st} it decides the switching that mitigates in an exponential otherwise linear pattern to steady-state frequency f_r, that is $f = f_r + (f_{st} - f_r)e^{\frac{-t}{\tau}}$ [21] as demonstrated in Fig. 1 [21], whereas τ indicates frequency time constant and t indicates time.

3.1.1	6th line	As in eq.(1), during the output, augmented voltage at one observed period of the rectifier, whereas $\mathrm{i_c}$ indicates the capacitor current, $\mathrm{i_R}$ indicates load current, $\mathrm{i_D}$ indicates the summation of the current of two rectifier diodes, and $\mathrm{C_0}$ indicates output current.	As in eq.(1), during the output, augmented voltage at one observed period of the rectifier, whereas $\mathrm{i_c}$ indicates the capacitor current, $\mathrm{i_R}$ indicates load current, $\mathrm{i_D}$ indicates the summation of the current of two rectifier diodes, and $\mathrm{C_0}$ indicates output current [21].
3.1.1	18th line	In Eq. (3), $\mathrm{C_r}$ indicates the capacitor resonant, $\mathrm{V_{C_r}}$ indicates the capacitor resonant voltage, $\mathrm{R_L}$ indicates the significant resistor load, $\mathrm{Z_0}$ states the resonant impedance, $\mathrm{i_{Lr}}$ states the inductor resonant current and $\mathrm{T_s}$ states the switching period.	In Eq. (3), $\mathrm{C_r}$ indicates the capacitor resonant, $\mathrm{V_{C_r}}$ indicates the capacitor resonant voltage, $\mathrm{R_L}$ indicates the significant resistor load, $\mathrm{Z_0}$ states the resonant impedance, $\mathrm{i_{Lr}}$ states the inductor resonant current and $\mathrm{T_s}$ states the switching period [21].
3.1.1	Above the Eq. (8)	Fig 2 states the flow chart of the state variable measurement.	Fig 2 states the flow chart of the state variable measurement [21].
3.1.2	10th line	Actually, during the first switching duration, the resonant current's peak value is stated in Eq. (9), whereas $\mathrm{V_{in}}$ indicates the output voltage and $\mathrm{R_l}$ indicates the input resistor.	Actually, during the first switching duration, the resonant current's peak value is stated in Eq. (9), whereas $\mathrm{V_{in}}$ indicates the output voltage and $\mathrm{R_l}$ indicates the input resistor [21].
5.2	Table 1 Table 2 Table 3 Table 4 Table 5	**Table 1.** Analysis of steady-state for I_{Lrm} of the first experiment **Table 2.** Analysis of steady-state for V_0 of the first experiment **Table 3**. Analysis of steady-state for I_{Lrm} of the second experiment **Table 4**. Analysis of steady-state for V_0 of the second experiment **Table 5**. Analysis of steady-state for I_{Lrm} for the third experiment **Table 5**. Analysis of steady-state for V_0 for the third experiment	**Table 1.** Analysis of steady-state for I_{Lrm} of the first experiment [21] **Table 2.** Analysis of steady-state for V_0 of the first experiment [21] **Table 3**. Analysis of steady-state for I_{Lrm} of the second experiment [21] **Table 4**. Analysis of steady-state for V_0 of the second experiment [21] **Table 5**. Analysis of steady-state for I_{Lrm} for the third experiment [21] **Table 5**. Analysis of steady-state for V_0 for the third experiment [21]
6	4th line	Nevertheless, the LLC RC parasitic modules had an important effect in sensible applications, like the soft-switching of power devices and power on the loss of the conduction, the voltage oscillation across rectifier diodes, at light load condition the unregulated output voltage and etc.	Nevertheless, the LLC RC parasitic modules had an important effect in sensible applications, like the soft-switching of power devices and power on the loss of the conduction, the voltage oscillation across rectifier diodes, at light load condition the unregulated output voltage and etc [21].

Included Reference

[21] Zheng, R., Liu, B. and Duan, S., "Analysis and parameter optimization of start-up process for LLC resonant converter", IEEE Transactions on Power Electronics, Vol. 30(12), pp.7113-7122, 2015.