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REVIEWER'S REPORT

Manuscript No.: IJAR-59381

Title: Improving Electrical Power Quality During Photovoltaic Feed-in to the Power Distribution Grid Using a Parallel Active Filter with MPPT (P&O) Control.

Recommendation:
Accept

Rating	Excel.	Good	Fair	Poor
Originality	Yes			
Techn. Quality		Yes		
Clarity	Yes			
Significance		Yes		

Reviewer Name: Dr. Ashish Yadav

Detailed Reviewer's Report

Reviewer's Comment for Publication.

Acceptance Comment are mentioned below suitable for the paper titled "Improving Electrical Power Quality During Photovoltaic Feed-in to the Power Distribution Grid Using a Parallel Active Filter with MPPT (P&O) Control"

Reviewer Comments: Accept

Reviewer Comments –

1. Introduction

The introduction should be strengthened by clearly explaining the increasing penetration of grid-connected photovoltaic systems and its associated power-quality challenges. The authors should discuss the effects of nonlinear loads, harmonic currents, reactive power, and voltage/current waveform distortion on distribution-grid performance. The motivation for integrating a parallel active power filter with the PV system should be explicitly established. The research gap and the specific contribution of the proposed PV–active-filter configuration should also be clearly stated. This will help readers understand the novelty and practical significance of the study.

2. Literature Review

The literature review should provide a more systematic discussion of recent research on PV grid integration, active power filters, harmonic mitigation, and MPPT techniques. Relevant studies using conventional and advanced MPPT methods should be compared with the proposed P&O-based approach. The authors should also highlight the limitations of existing approaches, particularly regarding simultaneous harmonic compensation and reactive-power management. A comparative discussion of

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active-filter configurations would further establish the contribution of the present work. Incorporating recent literature will strengthen the theoretical foundation and demonstrate the relevance of the proposed methodology.

3. Solution Approach / Methodology

The solution approach is appropriate and technically well structured, particularly the integration of the PV generator, BOOST converter, MPPT-P&O controller, power converter, and parallel active filter. The manuscript should provide a clearer explanation of the control strategy and the interaction between the individual components. The design parameters, control assumptions, simulation conditions, and system ratings should be sufficiently described to ensure reproducibility. The selection of the LC filter and P&O algorithm should also be technically justified. A clear block diagram and/or control-flow representation would further improve the presentation of the methodology.

4. Results and Discussion

The simulation results provide convincing evidence that the proposed configuration improves the power quality of the grid-connected PV system. In particular, the reported THD of 0.49% indicates substantial harmonic reduction and demonstrates compliance with the considered IEEE 519-1996 criterion. The authors should provide a more detailed interpretation of voltage/current waveforms, harmonic spectra, reactive-power compensation, and PV power delivery. Where possible, the proposed configuration should be quantitatively compared with the system without active filtering. Such comparison would clearly demonstrate the improvement achieved by the proposed approach and strengthen the discussion of the simulation results.

5. Conclusion

The conclusion appropriately highlights the effectiveness of the proposed parallel active-filter configuration for improving power quality during photovoltaic power injection. The reported results demonstrate that the combination of the PV system, BOOST converter, P&O-based MPPT, and active filtering can effectively mitigate harmonic distortion and improve grid performance. The achieved THD of 0.49% is a strong result and supports the applicability of the proposed approach. The authors should briefly restate the principal quantitative findings and practical implications. Future work could consider experimental validation, real-time implementation, alternative MPPT algorithms, and performance evaluation under varying solar irradiation and load conditions.