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REVIEWER'S REPORT

Manuscript No.: IJAR-53816 Date: 13-09-2025

Title: MAGNETOTRANSPORT IMPACT ON SHUNT RESISTANCE IN BIFACIAL c-Si CELLS: A NEAR-SHORT-CIRCUIT ANALYSIS

Recommendation:
Accept

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

Reviewer Name: Dr. Ashish Yadav **Date:** 13-09-2025

Detailed Reviewer's Report

Reviewer's Comment for Publication.

Manuscript accepted in the current form. Here are five concise and positive acceptance comments suitable for acknowledging the value of the paper titled "**MAGNETOTRANSPORT IMPACT ON SHUNT RESISTANCE IN BIFACIAL c-Si CELLS: A NEAR-SHORT-CIRCUIT ANALYSIS**

Reviewer Comments: Acceptance

1. Introduction

The introduction clearly identifies the problem of shunt resistance (R_{sh}) instability in bifacial crystalline silicon (c-Si) solar cells and situates it within the context of device reliability. By linking the study to photocurrent plateau stability, low-voltage slope, and open-circuit voltage behaviour, it establishes strong motivation and relevance for the photovoltaic community.

2. Literature Review

The manuscript builds upon prior work on illumination geometry, passivation strategies, and transport phenomena, while highlighting a gap—namely, the underexplored role of magneto transport effects on R_{sh} characterization. This adds novelty and positions the paper well against existing state-of-the-art studies.

3. Solution Approach

The study adopts a physics-grounded methodology combining illumination geometry (rear, dual, bifacial), base thickness variation, and magnetic-field dependence to map out R_{sh} behaviour. This multifactorial design demonstrates rigor and ensures that the conclusions are not artifact-driven but systematically validated.

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4. Results

The results are significant and practically relevant:

- Clear demonstration that dual/bifacial illumination stabilizes R_{sh}.
- Evidence that thinning to ~100 µm enhances R_{sh} under good passivation.
- Novel identification of Lorentz-force-driven changes in slope and apparent R_{sh}, which prevents misinterpretation in J–V diagnostics.

These findings provide both mechanistic insight and design guidelines for next-generation bifacial solar devices.

5. Conclusion

The conclusion synthesizes experimental observations into actionable recommendations: improve surface passivation, leverage bifacial operation to mitigate leakage, and account for magneto transport in metrology. Furthermore, it suggests logical extensions (temperature, field orientation, 3D leakage mapping), showing forward-looking research potential. The study closes with practical implications for stabilizing performance under real-world operating conditions.