Review of manuscript:

"**Evaluating the Effectiveness of Aluminum Coatings on Patch-Repaired Composites Using Electro-Thermal Analysis"**

This manuscript makes a valuable contribution to composite repair research, particularly in exploring aluminum coatings using electro-thermal modeling. The methodology is robust, with experimental validation and finite element simulations effectively supporting the findings. The work is timely and relevant, offering practical insights for aerospace and high-performance industries. While the study is well-structured, minor revisions are needed to improve figure annotations, provide additional details on material properties and boundary conditions, and refine grammatical expressions. Addressing these points will enhance the clarity and accessibility of the manuscript, ensuring it meets high publication standards. With these changes, the paper will be ready for publication.

Minor Concerns

1. **Figure Annotations:**

Figures 3 and 4 provide valuable visualizations but lack adequate annotations. Adding labels to clarify specific elements (e.g., the key process steps in Figure 3 or the axes in Figure 4) would make them more intuitive.

1. **Material Properties:**

The manuscript mentions specific material properties for aluminum coatings but does not detail their source or how they were validated. A brief discussion or citation would enhance credibility.

1. **Boundary Conditions:**

While the electro-thermal modeling is well-described, more detail on the boundary conditions used in simulations (e.g., temperature, load conditions) would improve transparency.

1. **Practical Implications:**

The conclusions provide recommendations for aluminum coatings but do not explore limitations or potential challenges in scaling this method for industrial applications. A brief discussion would add depth.

1. **Nomenclature Placement:**

The nomenclature currently appears early in the text. Moving it to the end of the manuscript would align with common formatting practices and improve readability.

1. **Numerical Stability of the FEM Model:**

The manuscript does not discuss whether numerical stability issues (e.g., mesh dependency or solver convergence) were encountered during FEM simulations. A brief note on these aspects would strengthen the methodological robustness.

1. **Scalability to Different Composite Types:**

The study focuses on a specific composite material. Including a brief discussion on whether the findings apply to other composite types (e.g., carbon or glass fiber composites) would expand the scope.

1. **Conclusion Expansion:**

The conclusion is concise but could briefly touch on future research directions, such as optimizing aluminum coatings or exploring multi-physics interactions.

Grammatical and Expression Errors

? Abstract: Original: "This study propose an electro-thermal modeling methodology..."
? Corrected: "This study proposes an electro-thermal modeling methodology..."
? Original: "and validate its applicability in composite patch-repair..."
? Corrected: "and validates its applicability in composite patch-repair..."
?
? Introduction (Line 23): Original: "The use of aluminum coating provide excellent thermal stability..."
? Corrected: "The use of aluminum coatings provides excellent thermal stability..."
?
? Section 2.3 (Line 78): Original: "Finite element simulations is employed to..."
? Corrected: "Finite element simulations are employed to..."
?
? Section 3.2 (Line 112): Original: "Figure 3 show the flowchart of the methodology..."
? Corrected: "Figure 3 shows the flowchart of the methodology..."
?
? Section 4.1 (Line 152): Original: "The comparison of experimental and simulated result indicate..."
? Corrected: "The comparison of experimental and simulated results indicates..."
?
? Section 5.2 (Line 197): Original: "The aluminum coating furnish better thermal resistance..."
? Corrected: "The aluminum coating provides better thermal resistance..."
?
? Conclusion (Line 230): Original: "This research highlight the importance of..."
? Corrected: "This research highlights the importance of..."
?
? Throughout the Paper: Ensure consistent use of technical terms, such as "electro-thermal modeling" (sometimes written as "electrothermal modeling").
? Correct spacing between values and units (e.g., "25C" → "25 °C").
? Standardize capitalization of terms like "Finite Element Method" and "Boundary Conditions."
?