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REVIEWER'S REPORT

Manuscript No.: IJAR-56455

Title: Active Vibration Control of Delaminated Composite Plates Using Active fiber Patches as Actuators and Sensors

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 "Active Vibration Control of Delaminated Composite Plates Using Active fiber Patches as Actuators and Sensors"

Reviewer Comments: Accept

Reviewer Comments –

Introduction

The introduction effectively establishes the engineering significance of laminated composite plates and the structural vulnerability caused by delamination. The authors clearly articulate the necessity of active vibration control in damage-prone composite systems, particularly where structural integrity and performance are critical. The motivation for integrating AFC patches as both actuators and sensors is well justified, emphasizing their lightweight, high actuation authority, and compatibility with composite substrates. The research objectives are clearly defined, and the scope of transient analysis under varying boundary and delamination conditions is logically presented.

Literature Review

The literature review adequately covers prior research on delamination modeling, smart composite structures, and active vibration control techniques. The discussion of First-Order Shear Deformation Theory (FSDT) for laminated plate analysis demonstrates appropriate theoretical grounding. Existing studies on piezoelectric-based control and finite element modeling approaches are properly contextualized, and the manuscript successfully identifies the gap in integrated transient analysis of delaminated plates with AFC-based velocity feedback control. The review is focused and relevant, though inclusion of a comparative summary table of previous works could further enhance clarity.

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Methodology
The methodology is well-structured and technically robust. The adoption of FSDT for modeling both intact and delaminated regions ensures realistic representation of shear deformation effects. The finite element formulation using eight-noded serendipity elements with five degrees of freedom per node is appropriate for laminated plate analysis. The derivation of governing equations through the principle of minimum total potential energy is mathematically consistent and clearly presented. Implementation in MATLAB demonstrates computational rigor, and the application of an active velocity feedback control law parameterized by gain (Gv) provides a systematic framework for evaluating control effectiveness. The parametric study design is comprehensive and logically organized.

Results and Discussion
The results are clearly presented and demonstrate strong analytical insight. The parametric analyses effectively illustrate the influence of boundary conditions, delamination size, AFC patch placement, and feedback gain on transient response and frequency characteristics. The findings confirm that increasing feedback gain significantly improves vibration attenuation, while delamination size adversely affects stiffness and dynamic stability. The study convincingly shows that optimal placement of the AFC patch enhances control efficiency. The discussion appropriately interprets the physical implications of the numerical results and highlights the interaction between structural damage and control performance.

Conclusion and Future Research Scope
The conclusion succinctly summarizes the key findings, emphasizing the effectiveness of AFC-based active velocity feedback control in mitigating vibrations in delaminated composite plates. The study demonstrates that accurate modeling of delamination combined with appropriate gain tuning significantly enhances vibration suppression and structural stability. For future research, the authors may consider experimental validation of the numerical model, implementation of advanced adaptive or robust control algorithms, investigation of multiple or evolving delaminations, and extension to nonlinear dynamic behavior under real-time loading conditions. Integration of uncertainty quantification and smart self-sensing control strategies could further strengthen the applicability of this framework in aerospace and high-performance structural systems.