

PROCEEDINGS

Dynamic Analysis of Stiffened Plates by the Peridynamic Mindlin Shell

Jin Han¹ and Qi Zhang^{1,*}

¹College of Shipbuilding Engineering, Harbin Engineering University, Harbin, 150001, China

*Corresponding Author: Qi Zhang. Email: zhangqi7000@hotmail.com

ABSTRACT

In this paper, we extend the Reissner-Mindlin shell theory based on peridynamics method proposed in [1] to the stiffened plate and explore its application to engineering problems, several examples are given to verify its effectiveness in the dynamic analysis. The coupling method is used in this paper to model the stiffened plate. The plate and the stiffener are treated as two independent shell to calculate the velocity and acceleration respectively, then the interaction between two parts of the stiffened plate is added at the coupling particle to satisfy the continuity condition. The non-local peridynamics theory of solids provides an integral formula that can replace the traditional local continuum mechanics model based on partial differential equations, which has natural advantages for solving fracture problems with discontinuities. Several numerical examples are present and compared with the numerical results of other methods. The results show that the peridynamic Mindlin shell theory has good accuracy and stability when solving the dynamic response problems of the stiffened plate, which lays the foundation for the fracture problems of the stiffened plate structure.

KEYWORDS

Stiffened plate, peridynamics, Reissner-Mindlin shell theory

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References

1. Zhang, Q., Li, S., Zhang, A. M., et al. (2021). A peridynamic Reissner Mindlin shell theory. *International Journal for Numerical Methods in Engineering*, 122(1), 122- 147.



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