

## Acoustic radiation and sensitivity analysis of a randomly excited structure based on FEM/IBEM combined with PEM

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### Abstract

The objective of this study is to develop a computational method for calculating the acoustic radiation and sensitivity analysis of a structure subjected to a stochastic excitation, based on the finite element method (FEM), the indirect boundary element method (IBEM) and the pseudo excitation method (PEM). In this work, FEM and IBEM are used respectively to calculate the dynamic and acoustic responses of a structure, and PEM is used to determine the acoustic stochastic responses for the acoustic radiation problems via transforming the random responses into the structural-acoustic harmonic ones. Using the PEM, the acoustic radiation sensitivities of the structure are developed in the context of the transformed harmonic sensitivity analyses, and they are validated by comparing with the results predicted using the finite difference method. Numerical example is given to demonstrate the effectiveness of the methods proposed in this paper.

### References

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