

# Reliable Dynamic Analysis of Structures Using Imprecise Probability

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## Abstract

Dynamic analysis of a structure is an essential procedure to design a structure subjected to a system of suddenly applied loads such as wind or earthquake excitations. However, throughout conventional dynamic analyses, the existence of uncertainties in mechanical properties of a structure is not considered. One method to quantify the presence of uncertainty in a physical system is to use an imprecise probability framework based on concept of p-boxes.

In this work, a new method for reliable dynamic analysis of structures using p-box based imprecise probability is developed. This method establishes a framework for handling incomplete information in structural dynamics. Using this method, the reliability and robustness in dynamic analysis are achieved. Example problem that illustrates the developed algorithm is presented.