Kuczkowiak, A., Cogan, S., Ouisse, M., Foltête, E, Corus, M., 2020, Experimental validation of an info-gap uncertainty model for a robustness analysis of structural responses, ASCE-ASME *Journal of Risk and Uncertainty in Engineering Systems,* Part B: *Mechanical Engineering,* Vol. 6, #3, 1 September 2020, article number 030905.

Abstract The aim of this work is to propose an indicator, based on the info-gap approach, which assesses the robustness of the dynamic response of the model of a structure to lack of knowledge in the associated eigensolutions. The info-gap uncertainty model for the eigensolutions is constructed mode by mode based on a set of experimentally identified eigensolutions obtained from tests on a set of nominally identical structures. A robustness analysis is then performed, which provides a useful bound to the maximum response levels that are consistent with the defined uncertainty, thus allowing to extrapolate to a population of untested structures. The proposed methodology is validated experimentally on a simple structure composed of two plates clamped together on one side. Uncertainty is introduced by adding lumped masses at random locations. A subset of these test results is used to construct the info-gap model of the eigenproperties and the remaining data are used to confirm that the robustness curve usefully bounds the observed maximum responses.

Keywords Eigenvalues and eigenfunctions, Eigen-solutions, Experimental validations, Identical structures, Response levels, Robustness analysis, Simple structures, Structural response, Uncertainty modeling.