



Organizer :



Co-organizer :



Institute for Management and Business Research (IMBRe) Universiti Utara Malaysia







icar2021.kuptm.edu.my



VIBRATION ANALYSIS OF A THIN PLATE STRUCTURE VIA MODAL BASED UPDATING

M. A. S. Aziz Shah¹ *M. A. Yunus² mayunus@uitm.edu.my M. N. Abdul Rani³ Z. Yahya⁴

*Corresponding author

School of Mechanical Engineering, College of Engineering Universiti Teknologi MARA^{1,2,3} Kolej Universiti Poly-Tech MARA Kuala Lumpur⁴

ABSTRACT

Performance of the vibration responses of a structure dependent on the accuracy of the input properties values of the developed FE model. The initial FE results computed are often found not replicate well with the experiment due to the simplification of input parameters of the FE modelling. The deterministic reconciliation method of modal based updating can be used to alter the uncertain initial properties of the base model of the structure systematically. The design sensitivity is utilised to identify the potential parameters to responses to be used as the updating parameters. To evaluate the performance of the developed scheme, the base and the updated natural frequencies and mode shapes computed are compared with experimental results. The results showed percentage of error is 35.36 per cent from the initial model and the error of the improved model significantly reduced to 8.27 per cent. In conclusion, the modal based updating has been successfully reduced the discrepancy of initial FE model and the experiment result. Subsequently, the updated FE model can be used for further structural analysis with more confidence.

Keywords: Normal modes, modal analysis, Model Updating, FEA, EMA.

