

## **Reduced order model based identification of structural system with noise of response**

**Seongmin Chang<sup>1</sup>, Sungmin Baek<sup>2</sup>, and \*Maenghyo cho<sup>1</sup>**

<sup>1</sup>Department of Mechanical and Aerospace Engineering, Seoul National University, Seoul, South Korea

<sup>2</sup>Hyundai Heavy Industry, Ulsan, South Korea

\*Corresponding author: mhcho@snu.ac.kr

In this study, we propose structural system identification method which efficiently identifies a system from measured system responses with noise. In general, it is hard to measure overall responses without noise. It thus is important to properly deal with responses not measured and noise generated from measurements. We project the responses not obtained using the system reduction method, one of reduced order model, instead of converting that to additional unknowns. Then, we devise and apply the method for selection of unknown variables which dominantly affect in system identification. By using the reduction method and the selection method, the system is easily identified due to solving the inverse problem with only dominant unknown variables. This study establishes the proposed method and numerical examples with pre- assumed noise are calculated to verify the proposed method.

**Keywords:** System identification, Reduction method, noise