Problems and Solutions in Identification of the Parameters of Mechanical Joints

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ABSTRACT

Generally, the properties of mechanical joints are very difficult to find by theoretical methods. Hence, experimental identification methods become the most important approaches to find the joint properties. In this work, the basic problems in identification of the joint parameters from the measured frequency response functions of the structure were discussed. The problems include the problem of measurement noise, the problem due to the different magnitude of orders of different parameters and the problem due to the characteristics of the structure itself. Based on the understanding in these problems, some solutions were proposed in this work. The accuracy and feasibility of the proposed methods were verified theoretically and experimentally. The results show that, basically, the unavoidable measurement noise in the frequency response functions is the fundamental problem; however, the severity of the noise problem is magnified by the other problems.