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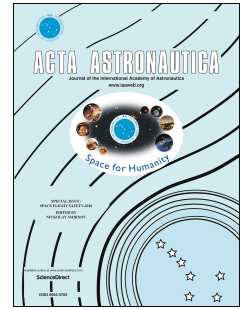
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# Parameter identification for structural dynamics based on interval analysis algorithm

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## Abstract

A parameter identification method using interval analysis algorithm for structural dynamics is presented in this paper. The proposed uncertain identification method is investigated by using central difference method and ARMA system. With the help of the fixed memory least square method and matrix inverse lemma, a set-membership identification technology is applied to obtain the best estimation of the identified parameters in a tight and accurate region. To overcome the lack of insufficient statistical description of the uncertain parameters, this paper treats uncertainties as non-probabilistic intervals. As long as we know the bounds of uncertainties, this algorithm can obtain not only the center estimations of parameters, but also the bounds of errors. To improve the efficiency of the proposed method, a time-saving algorithm is presented by recursive formula. At last, to verify the accuracy of the proposed method, two numerical examples are applied and evaluated by three identification criteria respectively.

**Keywords:** parameter identification; interval analysis algorithm; central difference method; ARMA system; identification criteria

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