

Method for determining signal homogeneity when measuring dynamic processes

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The paper focuses on the analysis of the results of measuring vibration loads, the results being obtained by known methods of statistical processing of measurements of random processes. We used criteria for homogeneity of mass statistics to select homogeneous populations of experimental data. We found that the homogeneity of statistics should be evaluated after obtaining the results of measurements of vibration loads at all points, flight modes and operation of the aircraft power unit. The homogeneity of the vibration loads measured hence characterizes the stability of specific vibration sources. From the measurement results obtained, harmonic components are distinguished, and the characteristics of only random vibration are generalized. We propose that the criteria based on the representation of generalized characteristics should be implemented into practice. Findings of the research show that it is necessary to test for statistical homogeneity in order to exclude unreasonable extreme values from the measurement results.

Keywords: vibration, statistics, homogeneity, criteria, measurements

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