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Application wavelet of the analysis for identification of acoustic issue's signals

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Acoustic issue at deformation and destruction of materials carries in itself weight of the information on the physical processes happening in structure of a material, mechanisms, to energy of destruction, intensity, speed of deformation, etc. The Majority of researches in the given area is devoted to the analysis of set of signals during tests of materials and designs. Few works are devoted to the analysis of structure of individual signals with the purpose of identification origin. It is connected with greater difficulties in decoding signals on the basis of the analysis of wave processes in researched materials. Earlier the first attempts on use Wavelet have been undertaken for the analysis of signals with the purpose of definition of a source issue's site^[1]. However researchers use existing base wavelets, created on the basis of base functions.

In the present work attempt is undertaken of creation wavelets, adapted under wave properties of a material and frequency properties of an acoustic path. Researches were carried out at excitation of mechanical modelling fluctuations of the set form. The form of signals is chosen proceeding from the received practical data about the fluctuations raised by various types of sources of issue (cracks, ensembles of dispositions, doubles). The received wavelet spectra of signals were processed by means of the correlation analysis with the purpose of identification of signals on numerical parameter. The qualitative analysis of spectrograms does not allow to state a full and correct estimation of the received data because of noise pollution a spectrum. The correlation analysis of signals does not give positive result because of transformation of waves at their distribution to a plate. Obtained data have been approved at research of mechanical destruction of real samples.

Carried out researches have allowed to draw a conclusion on necessity of use wavelets, the materials adapted under wave properties. The technique of identification of sources's types on wavelet to images of signals is developed.

References

- [1] Hamstad m. A. A wavelet transform applied to acoustic emission Signals. J. Acoustic Emission, 20 (2002). — P. 39-82.

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