

Detection of defects in devices with thermal sensors

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Results.

Activity is guided on evolution of methods of engineering diagnostic of structures and materials of thermal sensors by methods of an acoustic emission, magnetographic inspection and thermal methods of nondestructive check, and also the analysis of the appearances influencing origination of flaws in structures of a material.

Mathematical model operation of process of activity of various constructions of thermal sensors in different mediums and at different external actions allows to anticipate and in advance to reveal flaws. At the same time, model operation allows to reach peak response theoretically. By selection of different compositions of heterostructures for manufacture of the pickups analogous to photon receivers with the underload characteristic generation-recombination noise which do not grow with magnification of temperature.

Known mathematical models of a field of flaw the field of magnetization having the unknown geometrical form, and indeterminacy of a disposition of a point of examination do not consider such habits of real object, as the function of the magnetization localized in restricted field. The new method of the analysis of a magnetic field of flaws on the basis of mathematical model which is based on a vector non-linear integral equation of Fredholm of II-th kind, and for back-up checkout - on the determined step model is in-process offered. Schemes of the revealed forms of flaws of sections of the devices organized in extremal requirements of their maintenance are received.

For processing the signals received from thermal sensors (the thermovision images received at ecological monitoring) new algorithms on the basis of wavelets are developed. They have advantages before the Fourier-methods in the common and exact image of AND function in their manifold local habits. Wavelet-spectrograms are much more information, than normal Fourier-spectrograms and allow to reveal easily the most thin local habits of images that is very effective for problems of identification. Advantages вейвлетов speak that they are presented by much more manifold gang of types, than a single sinusoidal function in the ranks of the Fourier. It dilates quantity of applied problems which can be solved with their help.

In the field of an image processing вейвлеты give new and effective ways of their processing: decomposition, restorals and identifications of images removal from them noise, file compression. The methods offered in-process on the basis of wavelet-processing of images enable at qualitatively new level and much more effectively to conduct their martempering with the purpose of obtaining of the adequate information on prototype systems. They allow to reduce essentially information contents practically without losses of its quality.