**SIMULATION OF THE ACOUSTIC EMISSION IMPULSE SHAPE VARIATION PROCESS IN METAL**

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**Introduction:** In the last years the increasing value and the weight in the field of physical methods of a non-destructive testing occupies a method of acoustic emission (AE). The basic advantage of AE method is the possibility to discover dangerous defects on the large surface of testing and in hard-to-reach places, by putting pressure on the object of testing in the certain way. However widespread occurrence of AE method in practice of a non-destructive testing in many respects restrains by impossibility to determine the type of defect or to give the answer to the question whether this certain defect have acted AE signals on separate sensors (inaccuracy in determination of coordinate), by the most frequently used AE parameters (such as, for example, number of events, amplitude, energy, frequency etc.).

**Results:** The most informative parameter for identifying a AE signal source is its shape /1/. Due to the rapid growth within the last 3 years of possibilities of AE instrumentation on registration of the AE signal shape in the real time , the correlation link establishment between the AE signal shape of a source and the registered AE signal shape from a sensor becomes possible.

**Discussion:** It is known, that parameters of a signal of acoustic emission ( which in a sense represents stochastic pulse process) , it is possible to allow, are defined by integration interaction of huge quantity of single microsources. Each single pulse of acoustic emission of the certain nature, with a known degree of probability, repeats each other. To solve a problem of identification of a source of acoustic emission we did the following steps.

1. The set of amplitude-frequency characteristics of all acoustic path of object of the control over some set of distances from a source of acoustic emission have been recorded (with the set set of forms of a pulse by means of graduated indicator). This data is registered in a special database as a set of amplitude - frequency characteristics of a material- $\varphi_{m.}$
2. In an interval most similar to a amplitude -frequency interval of acoustic emission signals, amplitude - frequency characteristics of the gauges that are registering acoustic emission, were recorded - $\varphi_{д.}$
3. The same procedure was made during a record of the amplitude -frequency characteristic of the electronic registering block - $\varphi_{э.}$

It is necessary to note, that we do not touch here a procedure of a choice of each of these elements – sample source of an acoustic emission signal, the gauge and the registrar.

**Conclusions:** The physical-mathematical pattern of distinction the “pre-image” of AE signal from its source using its “image” (AE signal shape from the reception sensor) depending on spacing interval was built in this work, on an example of low carbon steels. This pattern is based on available data of acoustic signal propagation in metal. According to results of analysis some basic parameters of AE signal shape defining its variation were chosen. Held studies demonstrate a possibility in the near future to compare results of experimental data on registration of AE signal on different instrumentations with the purpose of creation of the unified database of real sources.

**References:** V.Kozharinov, New Mode of Acoustic Emission Non-Destructive Testing of Polyester Composite Materials; 15th World Conference on Non-Destructive Testing, Roma – 15-21 October 2000.