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Algorithm for on-site estimation of the time of arrival of impulse phenomena without the man in the loop

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Acoustic, hydroacoustic and seismic signals that are most often of practical interest are those whose nature is impulsive. The appearance of such forms of impulses is a consequence of the sudden release of energy at a location in a relatively short time. Estimation of the time of arrival of these signals, on several spatially distributed sensors, enables locating the place where these phenomena occurred, which is of particular importance. An algorithm has been developed that enables the time of arrival of impulse occurrence to be estimated on-site, without a human in the loop, and this has been demonstrated in many cases. The paper describes the algorithm, which time interval of the signal additionally segment and statistically analyse by calculating the variance, that is, the cumulative value. If the dynamics of the change in amplitude of the signal meets the adaptive limits, which are reached by analysing each individual time interval, the estimation of the arrival time of the amplitude front is approached by analysing the steepness of the cumulative variance of the observed segment of the signal.

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