

Instant Location Detection of Objects Moving at High Speed in C-OTDR Monitoring Systems

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Abstract : The practical efficient approach is suggested to estimate the high-speed objects instant bounds in C-OTDR monitoring systems. In case of super-dynamic objects (trains, cars) is difficult to obtain the adequate estimate of the instantaneous object localization because of estimation lag. In other words, reliable estimation coordinates of monitored object requires taking some time for data observation collection by means of C-OTDR system, and only if the required sample volume will be collected the final decision could be issued. But it is contrary to requirements of many real applications. For example, in rail traffic management systems we need to get data off the dynamic objects localization in real time. The way to solve this problem is to use the set of statistical independent parameters of C-OTDR signals for obtaining the most reliable solution in real time. The parameters of this type we can call as 'signaling parameters' (SP). There are several the SP's which carry information about dynamic objects instant localization for each of C-OTDR channels. The problem is that some of these parameters are very sensitive to dynamics of seismoacoustic emission sources but are non-stable. On the other hand, in case the SP is very stable it becomes insensitive as a rule. This report contains describing the method for SP's co-processing which is designed to get the most effective dynamic objects localization estimates in the C-OTDR monitoring system framework.

Keywords : C-OTDR-system, co-processing of signaling parameters, high-speed objects localization, multichannel monitoring systems

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