

Reduction of wind noise impact based on the use of data from a weather station in recording infrasound signals at IS43

We have developed a method of reducing wind noise impact on recording of infrasound signals by considering wind speed at IMS infrasound stations. Approbation of developed algorithms was performed at IS43. The likelihood ratio Λ for a model signal corresponding to a 10 kiloton atmospheric nuclear explosion (ANE) at the distance of about 3000 km from the infrasound station was used as a discriminant. Λ was assessed by a pair of values – a root-mean-square deviation of pressure pulsations σ_p and a mean value of wind speed module $\bar{v}$ that were averaged by the duration of an ANE model signal. We used data for 3 years of different seasons and different time of the day, the total duration of 36 hours. Over 20 thousand ANE model signals were included in the background. 2D distributions of conditional probability $P((\sigma_p, \bar{v})|H)$ and $P((\sigma_p, \bar{v})|\bar{H})$ were generated for hypothesis H (ANE) and its alternative $\bar{H}$ and an operating characteristic of meteoselector was constructed on their basis. The analysis of the operating characteristic, which is a dependence of false alarms on the detection probability, allows to make a conclusion about the efficiency of the proposed method.

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