

## **Optimization algorithm for synergy of CTBT verification techniques in addressing IMS and OSI tasks**

We have developed an algorithm for CTBT verification methods synergy that ensure an optimal Neumann-Pearson operating characteristic of nuclear explosion detection based on a set of standard discriminants used in addressing IMS and OSI tasks. The algorithm is based on the structuring of observation space on the basis of likelihood ratio (ratio of probabilities to get this set of discriminant values in case of a nuclear explosion or its absence). We have determined conditions for applicability of the proposed algorithm and the its field of application and have given examples of possible discriminants when addressing IMS and OSI tasks. We have substantiated the dependence of false alarms on the nuclear explosion detection probability and shown that this algorithm is optimal based on Neumann-Pearson criterion.

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