



ID: O2.2-657

Type: Oral

[NO SHOW]Geophysical modeling mathematical software

Wednesday 30 June 2021 14:05 (10 minutes)

The importance of mathematical modeling lies in the implementation of complex calculations and analysis of results using known computational methods. Mathematical modeling provides a qualitative and quantitative prediction of the behavior of an object or a system in cases their study is difficult in reality.

The aim of this work was to create mathematical software that allows modeling geophysical background fields and their anomalies for the purposes of the CTBT On-site Inspection. The simulation results helped to better understand and describe changes of studied values for the search for the epicentral zone of the geophysical anomaly. And the use of data fusion method increased the efficiency of the algorithms performed to identify the location of the geophysical anomaly.

To achieve this goal, the following tasks were solved:

- analysis of the CTBTO verification regime;
- problem statement for mathematical modeling of gravity, magnetic, radionuclide anomalies;
- development of algorithms for solving formalized models;
- analysis of the feasibility of using data fusion for the selected methods;
- development of method and algorithm for data fusion;
- development of mathematical software.

The result of the research work was the created mathematical software that allows modeling background geophysical fields and their anomalies.

Promotional text

This mathematical software can visualize geophysical anomalies after different geophysical events. And the ability to data fusion refine the location of the center of the anomaly. This application can be useful for CTBT On-site Inspection and for training potential inspectors.

Primary author: Ms BUKHALINA, Sofya (National Research Nuclear University MEPhI, Moscow, Russian Federation)

Presenter: Ms BUKHALINA, Sofya (National Research Nuclear University MEPhI, Moscow, Russian Federation)

Session Classification: T2.2 - Challenges of On-Site Inspection

Track Classification: Theme 2. Events and Nuclear Test Sites: T2.2 - Challenges of On-Site Inspection