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System of the Complex Analysis of Satellite and Ground Waveform Data over Seismic Regions of the Earth

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In the context of Scientific Space System creation project for earthquake precursor's researches was developed software for the complex analysis of the satellite and ground waveform data.

The system consists of two programs TRASSA-OMIR and SOS-OMIR. For the chosen seismic region and time interval the TRASSA-OMIR program allows to predict satellite orbital position (altitude, subsatellite point latitude and longitudes), and also other parameters for these point - L-shell, satellite light exposure, distance from the satellite to earthquake epicenter, geomagnetic field parameters, etc. As initial conditions for satellite orbit prediction we used classical elements and elements of TLE format (NORAD).

The SOS-OMIR program is intended for complex waveform data (satellite and ground) processing and analysis in the chosen seismic regions with use of the modern techniques based on methods of the spectral analysis, filtration, statistical and correlation-regression analysis, etc. The special feature of the given system is orientation to processing of ground and satellite data for detecting of anomalies related to seismic events. The SOS-OMIR program have a following futures:
- it allows to do earthquakes selection for the area set by latitude and longitude, time interval and earthquake power class;
- it allows to select waveform data rows from a database (ground and corresponding satellite data) during the periods previous earthquakes;
- it provides graphical display of waveform data rows with place on a time scale earthquakes labels and amplitudes;
- if it necessary, the program allows to do interactive noise and errors correction in waveform data row;
- it allows to select from the chosen waveform data row a segment for the set time interval and vice versa - to join isolated data row;
- it allows to work with separate rows as well, as with group of data rows by various methods of the digital analysis.

The developed system of the complex analysis is the user's universal tool for work with separate and complex ground and satellite data rows irrespective of the physical nature of signals.