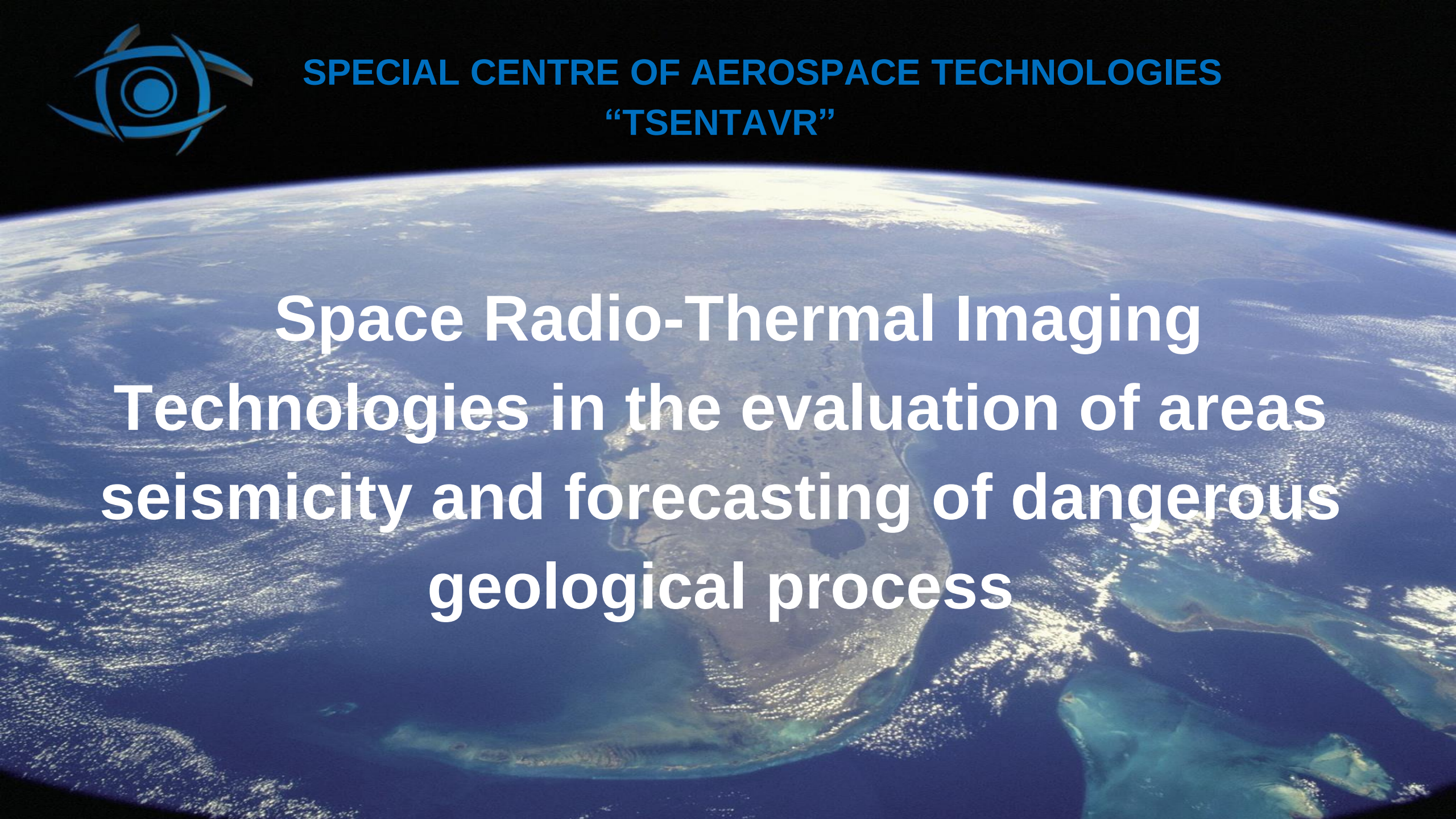

SPECIAL CENTRE OF AEROSPACE TECHNOLOGIES
“TSENTAVR”

Space Radio-Thermal Imaging Technologies in the evaluation of areas seismicity and forecasting of dangerous geological process

Use of Radio-Thermal Imaging Technologies TSENTAVR for assessment of seismicity of the area

Radio-Thermal Imaging Technologies are an effective tool for solving problems of assessment or clarification of territory seismicity. At the same time, is used one of the methods for identification of potential earthquake source (PES) - on the basis of geodynamic data.

When allocating potential earthquake source (PES), the earth's crust and upper mantle are considered as a discrete-hierarchical structure, each block of which consists of smaller blocks and is itself part of a larger block.

It is established that geoblocks, as monolithic tectonic platforms, have a multistory structure. Dislocations with a break of continuity are classified as continental, regional and local. Local are divided into more minute on a: the closer to the surface, the more fractured the ledge and sedimentary rocks. The most active are deep faults; faults limit tectonic blocks that can be active and in a state of squeezing, separation, thrust fault or slip.

The fracture of the earth's crust, even if it has long been covered by valley filling, becomes apparent by temperature anomalies on the surface of the earth, and by temperature gradients in depth. Studying their dynamics, we can judge the phenomena that cause stresses and deformations in the earth's crust, fraught with cataclysms.

In these conditions, the main thing is the diagnostics of the earth's crust: the stresses and deformations in its seams can forecast the movements that cause earthquakes. It’s very important to assess the probability of a seismic event correctly and foresee earthquakes for any ground, where placed potentially hazardous objects (NPP). Thus, results obtained using RTT will be an invaluable source material for clarifying the seismicity of the projected construction ground or the active ground of the NPP, for increasing the information content of the engineering survey data, and, as a consequence, rational use of material for anti-seismic reinforcement of buildings.

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To determine concrete seismogenerating zones (or potential earthquake source - PES), it is necessary to identify specific structures within the limits of the selected subprovinces and seismotectonic zones: faults, suprafault folds and fault-related folds, earth's crust blocks, demonstrating active geological and seismic activity.

Complex analysis of a geological-geodynamic model created using data of Remote sensing and RTT technology, make it possible to draw a map of the faulty tectonics of the ground and the location of the object (radius 250, 150, 25 km), with the allocation and ranking of faults, stable blocks of the earth's crust.

The method allows to conduct large-scale survey in a short time at a predetermined depth (up to the mantle) and has maximum informative value in combination with other methods of remote sensing, used in assessing of territory seismicity.

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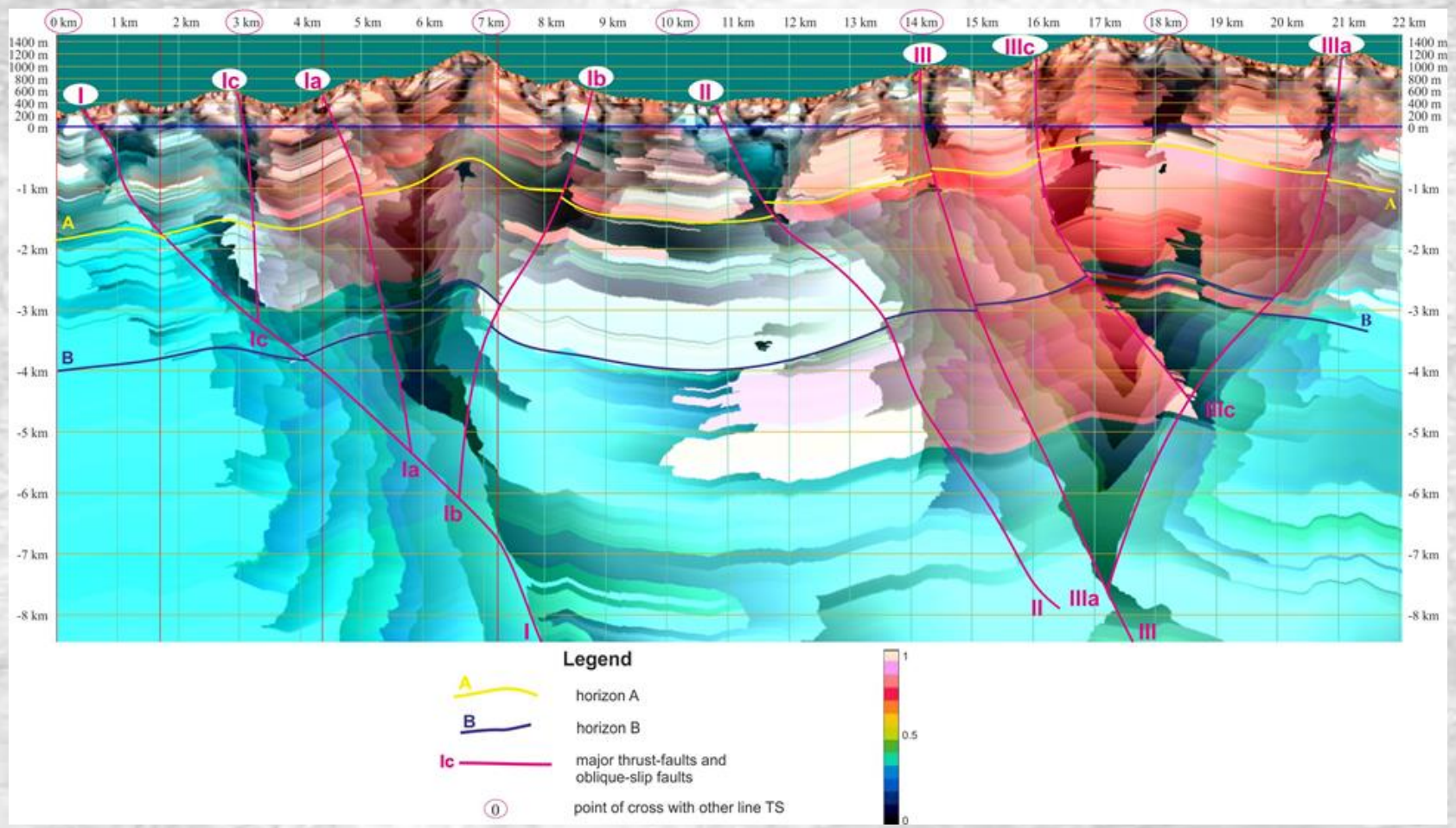

Display of the main elements of the geo-environment structure according data of the thermal imaging survey in the thermal field of the vertical geothermal section.

Work for the NPP grounds will be carried out in accordance with the IAEA Safety Guide No. SSG-9 "Seismic Hazards in Site Evaluation for Nuclear Installations". The results of the research can be used both to assess the seismicity of grounds and to monitoring geodynamic conditions in the area of NPP, where seismic assessment research have already done.

Thermal anomalies - indicators of seismic activity record over zones of large faults and intersections of fault zones. When processing repeated satellite images (monitoring seismic hazard), an estimate the activity of fault zones at the present stage of geological development.

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Modern technologies allowed to quickly identify natural and man-made situations in the performance of a number of works:

- The central part of Baku (Azerbaijan) -2000;
- Sochi (Russia) 2002-2003;
- Temryuk district of Krasnodar Krai (Russia) - 2004, 2009-2010;
- The central part of Kiev (Ukraine) 2005-2006;
- Gelendzhik (Russia) -2008;
- Anapa district (Russia) -2009;
- Absheron district (Russia) -2010;-
- Sochi region (Russia) -2010;
- Temryuk district (Russia) -2010;
- Tuapse region (Russia) -2010;
- Yeisk District (Russia) -2011;
- Abinsky district (Russia) -2011;
- Seversky district (Russia) -2011;
- Goryachy Klyuch (Russia) -2012;

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