Research and Production Enterprise

“GEOPROM” Ukraine

Corporate Presentation

Contents

- Company Profile
- Technology
- Applications
- Selected Case Studies

Company Profile
Who are we?

GEOPROM

- Headquartered in Kiev, Ukraine.
- Founded by geophysicists in 1997.
- Agents worldwide, (Canada, UK, Australia, South Africa, Colombia))
- 20 employees, high-end geophysicists, scientists, Doctors, PhD, **M.Sc.**.
- 100% privately owned company.
- Has developed a portfolio of non-invasive geophysical technologies for subsurface investigations of all types.
- Over 30 years experience in geophysical survey systems and methods.

Company Profile

Who are we?

Our research team

Dr. Sergey Levashov
CEO

Dmitry Bozhezha

Yuri Pischaniy

Konstantin Kuzhetsov

Company Profile
Who are we?

Company Profile
What do we do?

GEOPROM

Delivers geophysical survey and mapping services for various types of applications and environments:

- Hydrocarbon (Coal, Oil and Gas) Exploration,
- Mining and Mineral Exploration,
- Civil and Structural Engineering,
- Environmental Surveys,
- Groundwater Exploration and Monitoring,
- Archaeological Site Investigations.

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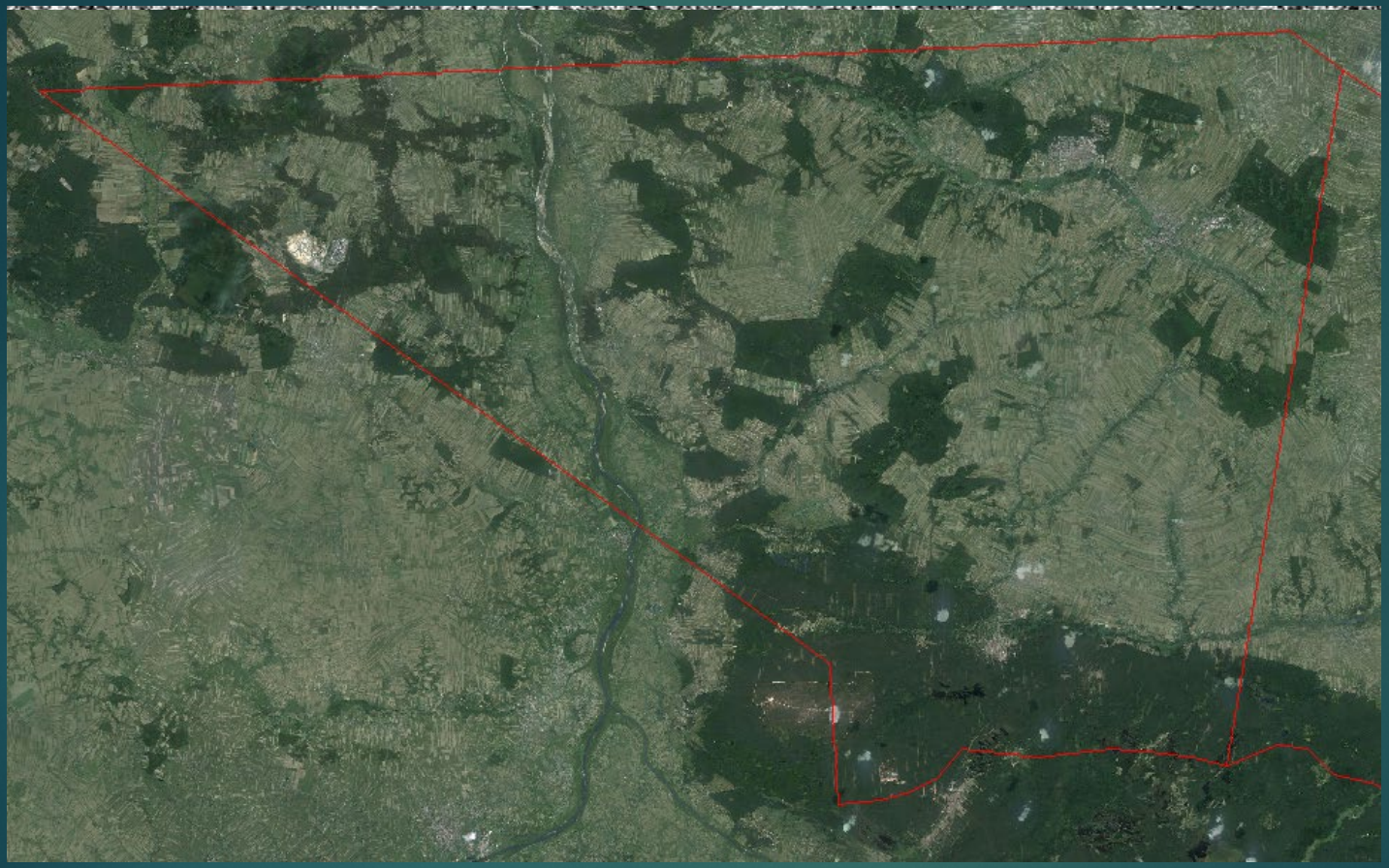
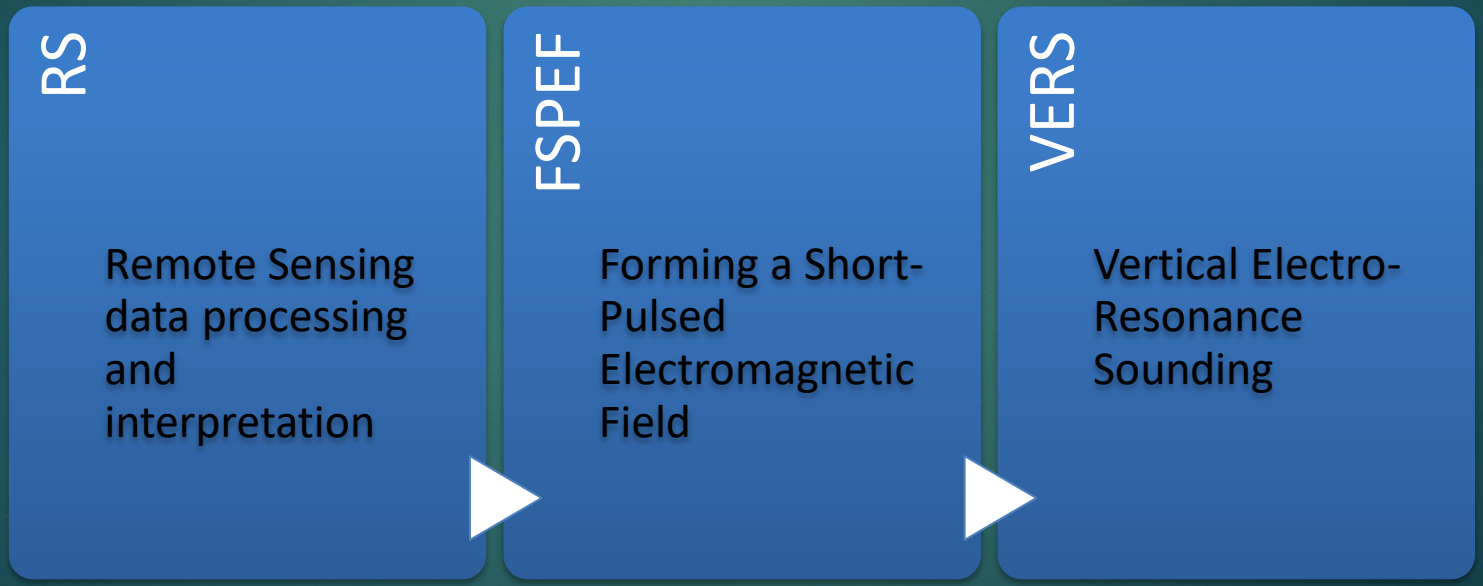


Technology

Today, our technology consists of three innovative methods based on frequency-resonate concept:



Technology
BENEFITS

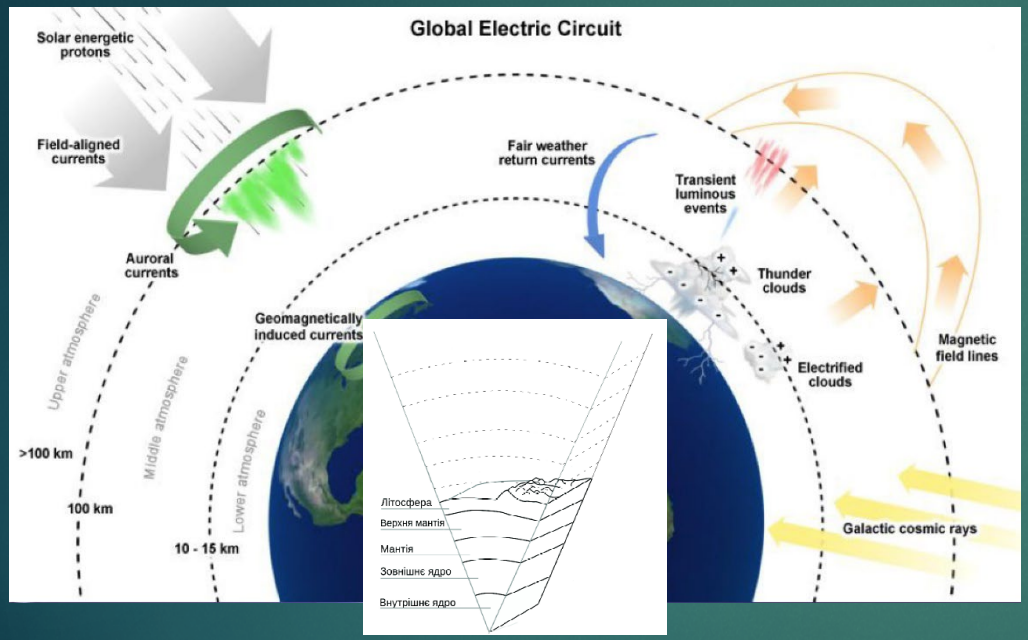
- Less time study, results in approx. 60 work days with partial deliveries.
- Accuracy, less than 1m in depth
- It lower cost, dramatically low in comparison with 3D seismic
- Proven technology, successful and comparable results.
- Negligible environmental impacts, it does not require an environmental license, it does not handle explosives or drilling.
- Small and specialized teamwork.

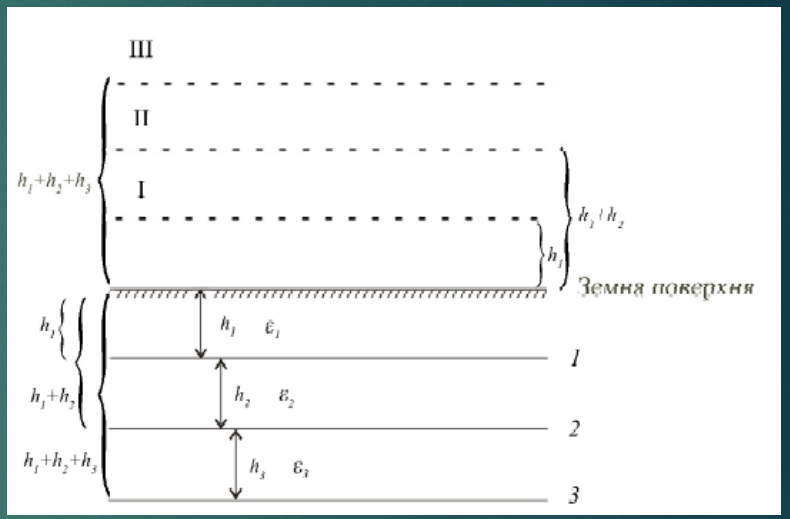
Technology
Comparison of advantages

	GEOPROM Technology	Seismic 2D/3D
Technology	• Geoelectric scientific basis. • Accuracy of < 1 m. • Accurate profiles • Technology oriented to HC	• Seismic reflection basis. • Accuracy of < 30 m. • Technology oriented to the geology.
Economic	• Low cost of exploration. • It reduces risk.	• Higher cost of labor and engineers, geologists. • It increases risk.
Logistic	• It decreases time. • It covers a larger territory	• It increases time. • It need more logistic and equipment.
Environmental	• It has not environmental impacts.	• Explosives • Perforations • Construction of roads • Environmental permitting
Final Result	• Certainly to find HC for the first stage.	• Uncertain, must be corroborated, high % error.

Technology development

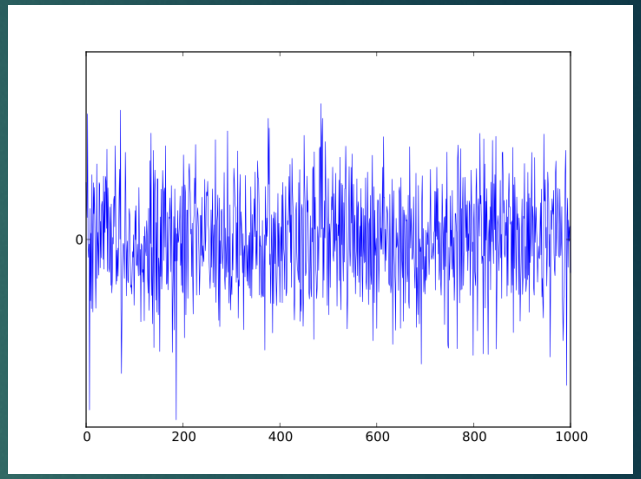
The development of our technology took place at the forefront of two sciences:
GEOPHYSICS AND ATMOSPHERIC PHYSICS

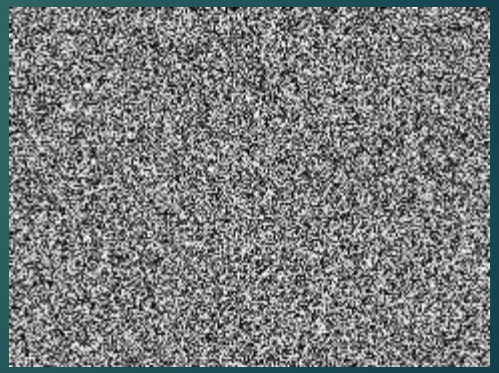




Technology development

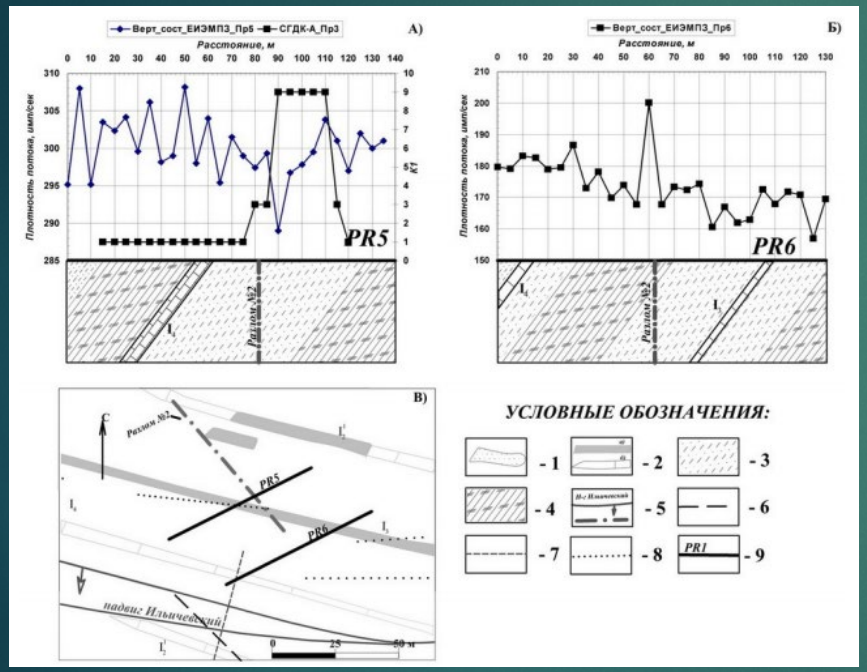
- Our technology of frequency resonant mineral exploration is a modification of the method of studying natural pulsed electromagnetic field of the Earth ("метод ЕИЭМПЗ“) , which was developed in the Soviet Union in the 70s.
- The classical method captures a huge amount of pulsed fields (white noise), the nature of which is related to the structural and lithological structure of the earth.

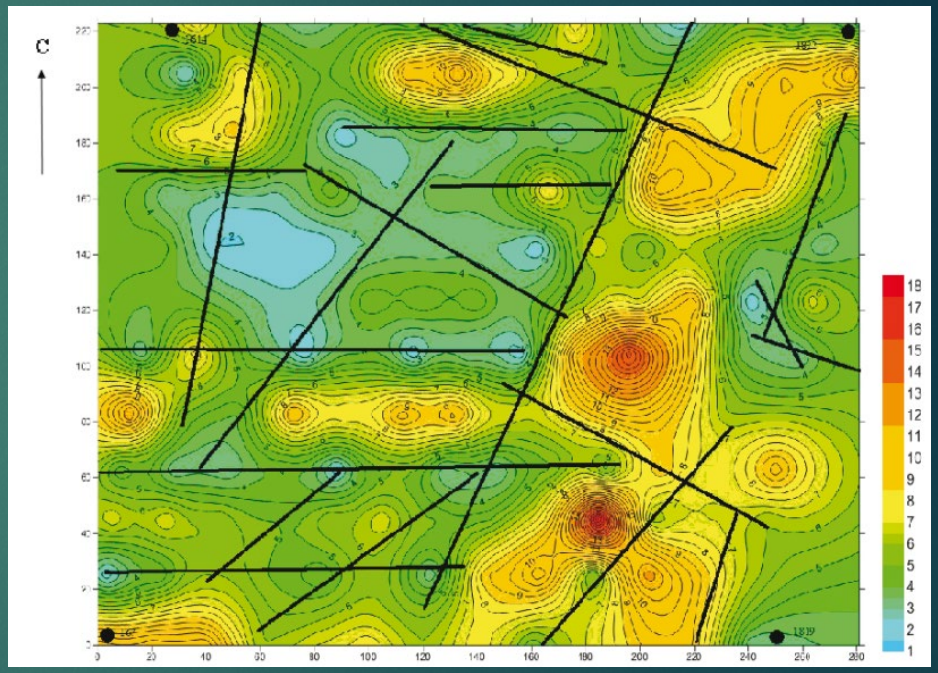




Technology development

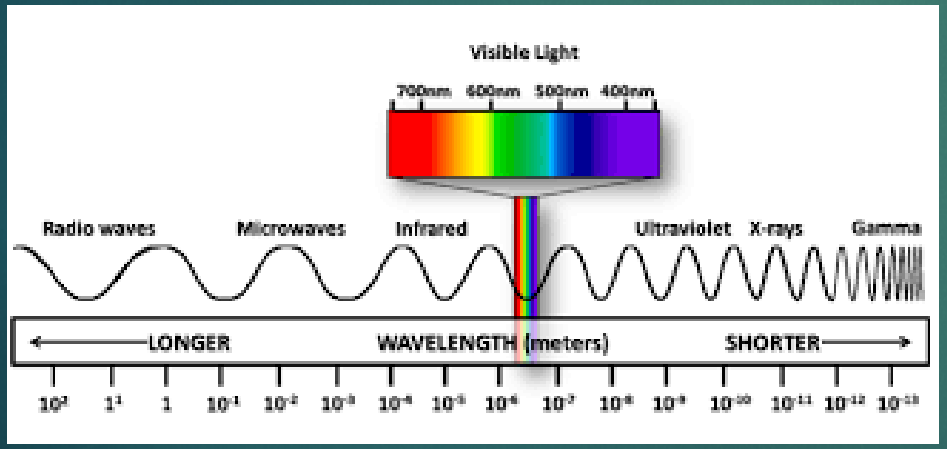
- The classical method used to find the faulting, the boundaries of different lithology, water.





Technology Innovations

- Our technology of the direct search of matter similar to the spectral analysis. Each material in the world has its own unique spectral characteristics that can be measured in the visible range.
- We have invented a method which allows to determine the frequency characteristics of each material in the radio range, on the basis of resonance amplification of signals.



Technology Innovations

- We determine the resonance frequencies for more than 100 materials:
- It allow us to obtain useful information from “noise” EM data.

Amber	**Янтарь**
Aluminium	Алюминий
Calcite	Кальцит
Clay	Глина
Coal	Уголь
Copper	Медь
Coral	Коралл
Diamond	Алмаз
Flint	Кремень
Gashydrate	Газогидрат
Gasoline	Газолин
Glass	Стекло
Glycerol	Глицерин
Gold	Золото

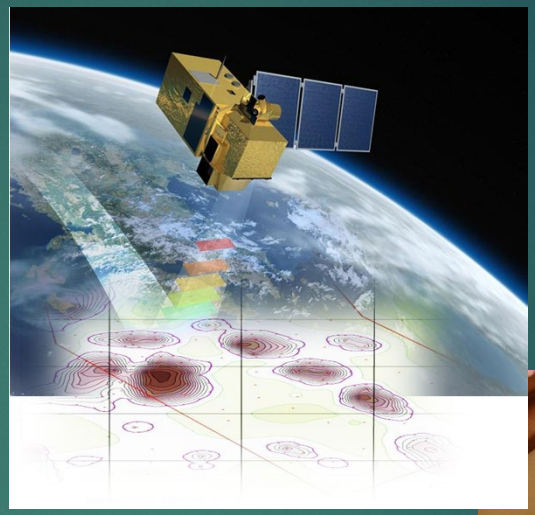
Granite	**Гранит**
Graphite	Графит
Gypsum	Гипс
Iron	Железо
Jasper	Яшма
Kerosene	Керосин
Lead	Свинец
Limestone	Известняк
Marble	Мрамор
Mel	Мел
Mercury	Ртуть
Methane	Метан
Oil	Нефть
Paraffin	Парафин

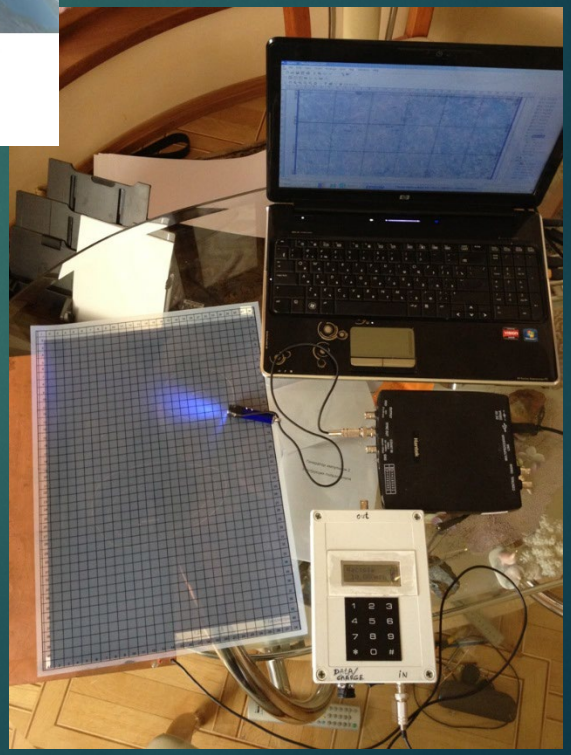
Platinum	**Платина**
Quartz	Кварц
Quartzite	Кварцит
Rubin	Рубин
Salt	Соль
Sand	Песок
Sapphire	Сапфир
Silver	Серебро
Sinks	Раковины
Soda	Сода
Sulphur	Сера
Tin	Олово
Uranus	Уран
Water (structured)	Вода
Zinc	Цинк

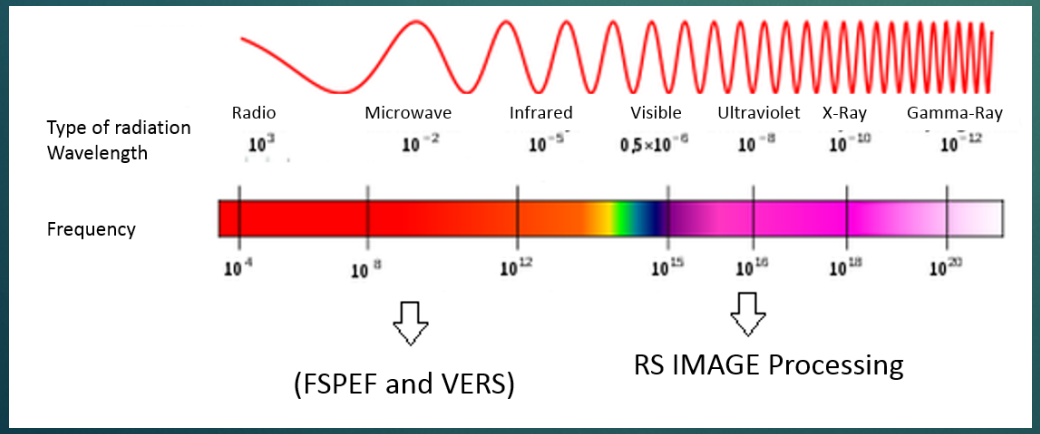
Technology components

Remote Sensing data processing and interpretation

- A satellite imagery based remote sensing technique.
- Does not require fieldwork on-site.
- Pre-existing satellite images are acquired and processed.
- Processing makes use of the resonant frequency technique.
- The result is a map showing the distribution of hydrocarbon or mineral deposits over the area of the prospect.



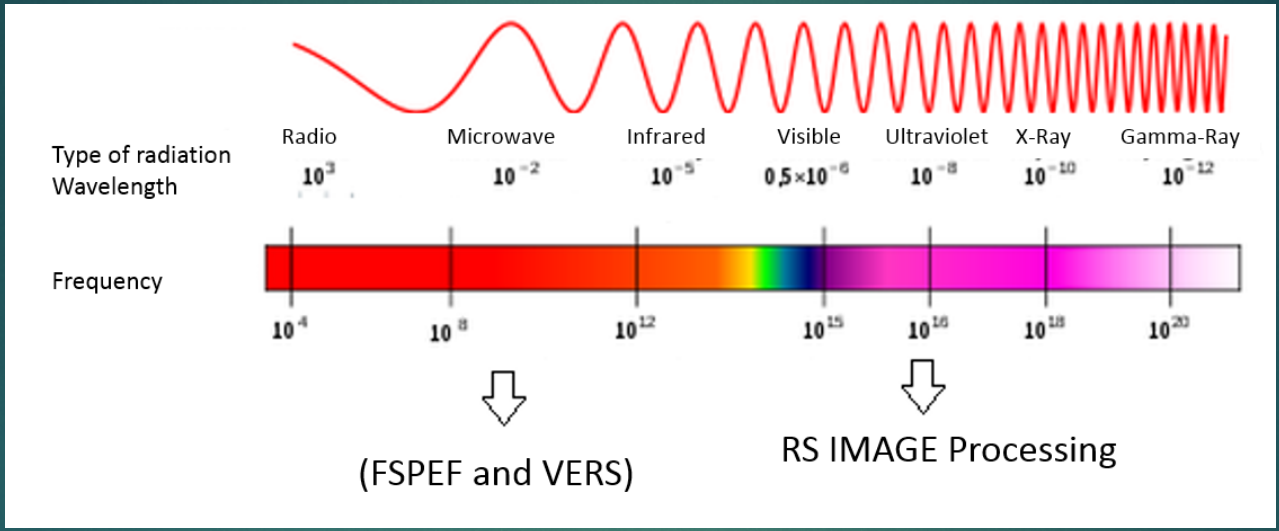




Technology components

Remote Sensing data processing and interpretation

Furthermore fixing pulsed natural electromagnetic fields of the Earth's, we studied also it effects satellite images of the Earth's surface in different spectral channels.



Current development of computer technology does not allow for the spectral analysis of all possible channels recorded by satellites where there is also information on the structure of the Earth and the objects in it.

To solve this problem we have used an analog optical processing method by which it became possible to carry out the classification of satellite images and allocate them abnormal radiation from various geological bodies in their frequencies.

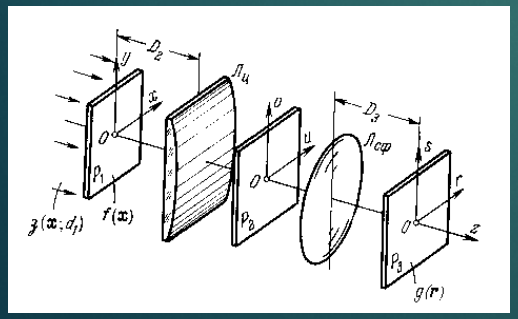
Technology components

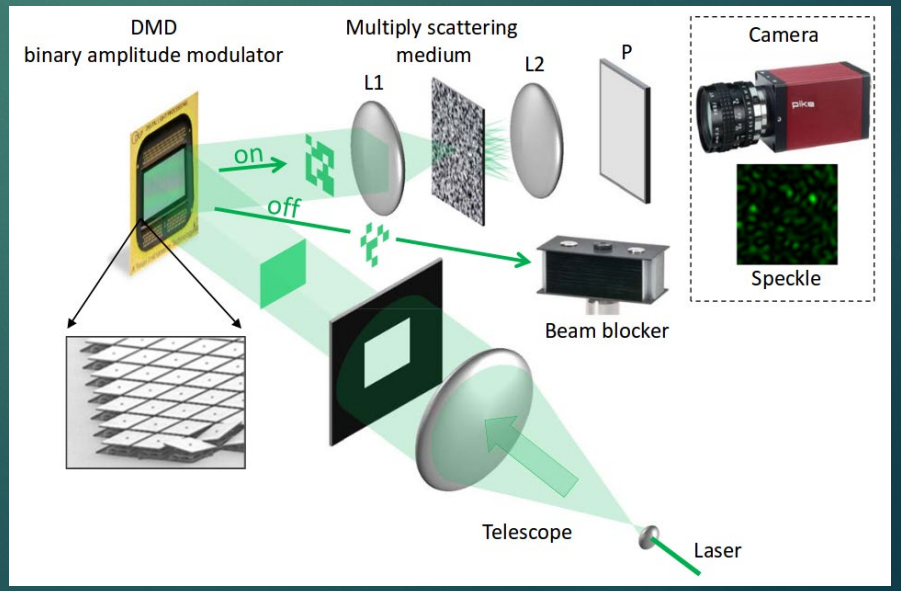
Remote Sensing data processing and interpretation

An optical computer (also called a photonic computer) is a device that uses the photons in visible light or infrared (IR) beams,rather than electric current, to perform digital computations.

Modern computer allows the calculation speed of 40 gigaflops, optical calculation is possible at speeds of tens of petaflops.

Giga	G	10^9	1000000000
Peta	P	10^{15}	1000000000000000



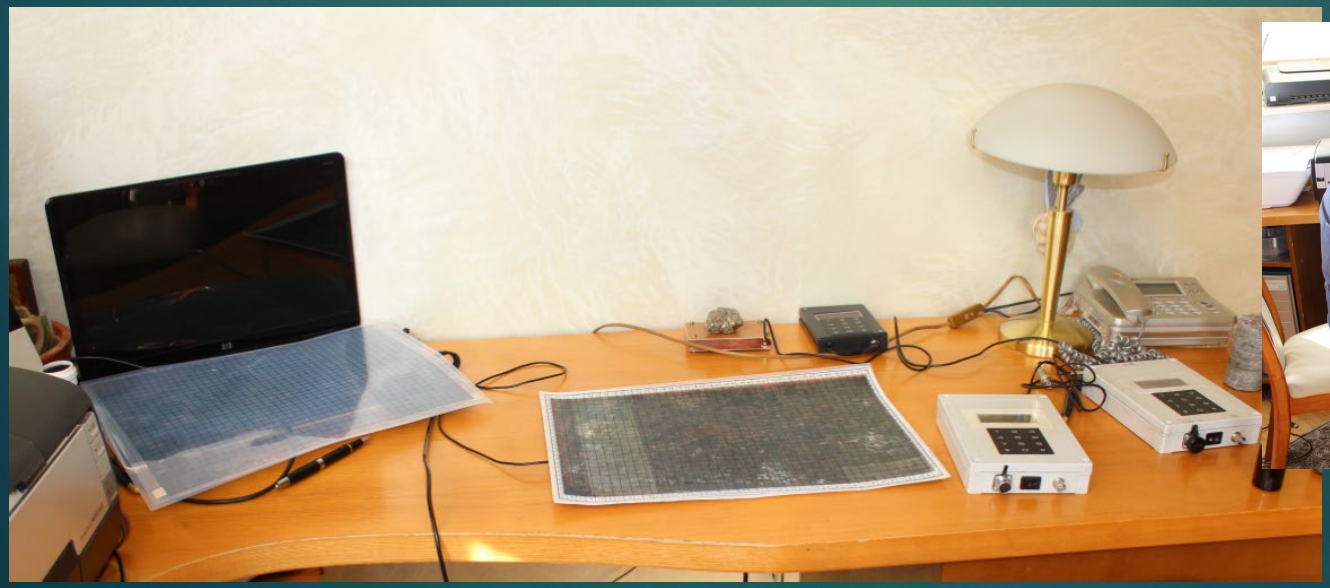


Technology components

Remote Sensing data processing and interpretation

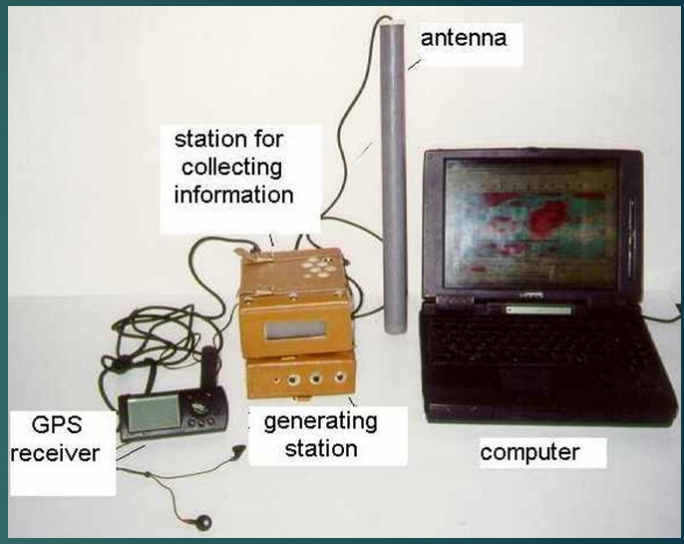
Our optical processing of satellite images:

Generator → Emission antenna → Pack of printed satellite images on film → Laser lights → Photo detector



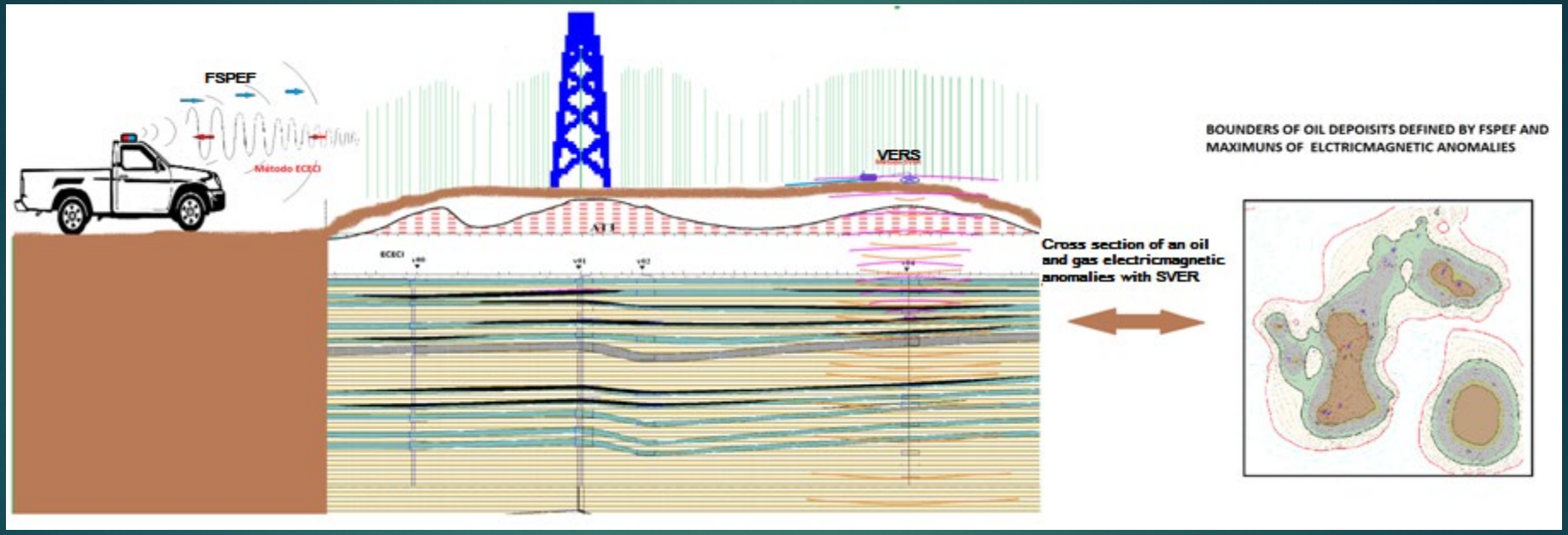
Technology
Field study

- These surveys can be conducted on land (on foot or using vehicles), on water or from the air.
- Operates in 2 modes: short-pulsed electromagnetic field (FSPEF) and vertical electric-resonance sounding (VERS).
- For detailed geophysical mapping of subsurface structures to depths of 8km.
- Can be applied to geological, engineering and environmental investigations.
- Used to identify & map hydrocarbons, a wide range of mineral deposits and aquifers.
- Mapping underground voids and pollution plumes in groundwater systems.



Technology

METHOD OF FORMING OF SHORT-PULSED ELECTROMAGNETIC FIELDS (FSPEF)



The FSPEF method is based on studying the process of the short-impulse electromagnetic field forming in small-sized dipole ferrite antennas. The application in this modification of the method of short but high-powered electric pulses gives us an opportunity to refuse the energy consumption.

Technology

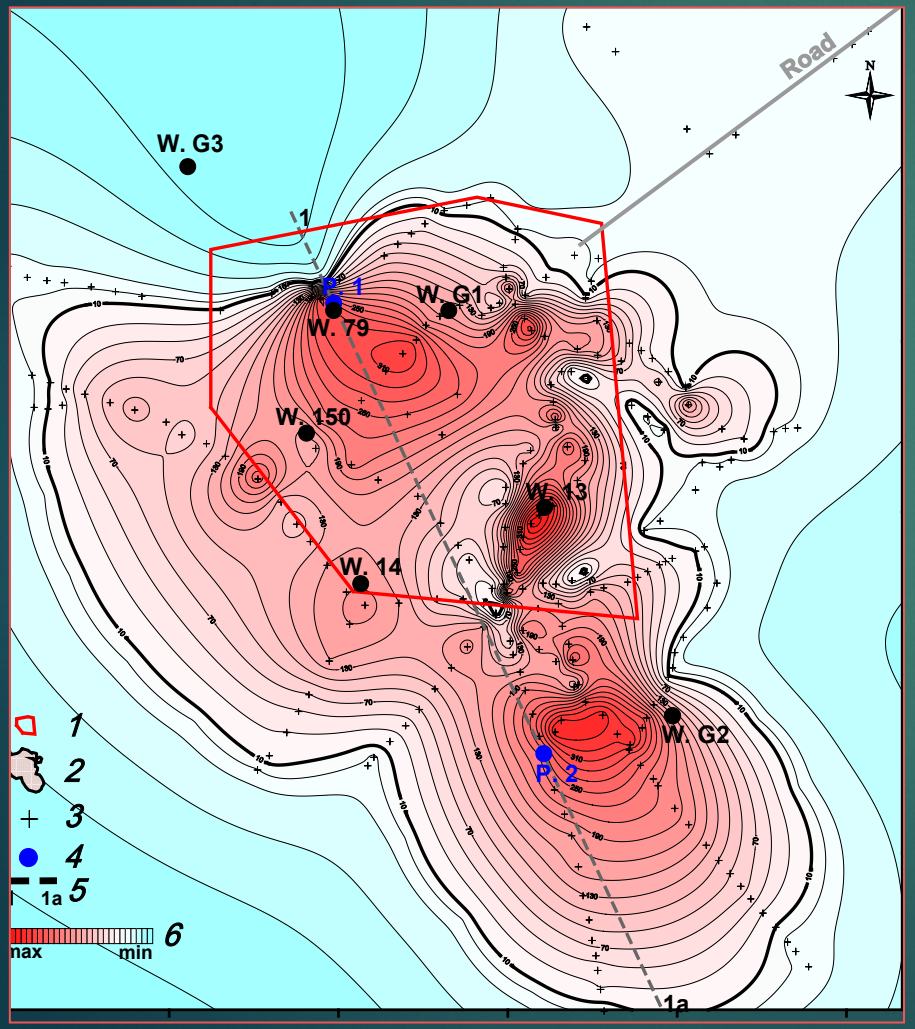
METHOD OF FORMING OF SHORT-PULSED ELECTROMAGNETIC FIELDS (FSPEF)

Data acquisition by method of forming electromagnetic short impulse fields from a vehicle or a boat, it highlights zones of localized anomalies and their boundaries.

Technology

METHOD OF FORMING OF SHORT-PULSED ELECTROMAGNETIC FIELDS (FSPEF)

FSPEF PRODUCT



Map FSPEF

1. Limits of oilfield
2. Oilfied's general lines with two structural traps
3. Beginning and exit points for VERS
4. Points of vertical sounding
5. Line of cross section
6. Scale of intensity

Technology

THE METHOD OF VERTICAL ELECTRIC-RESONANCE SOUNDING (VERS)

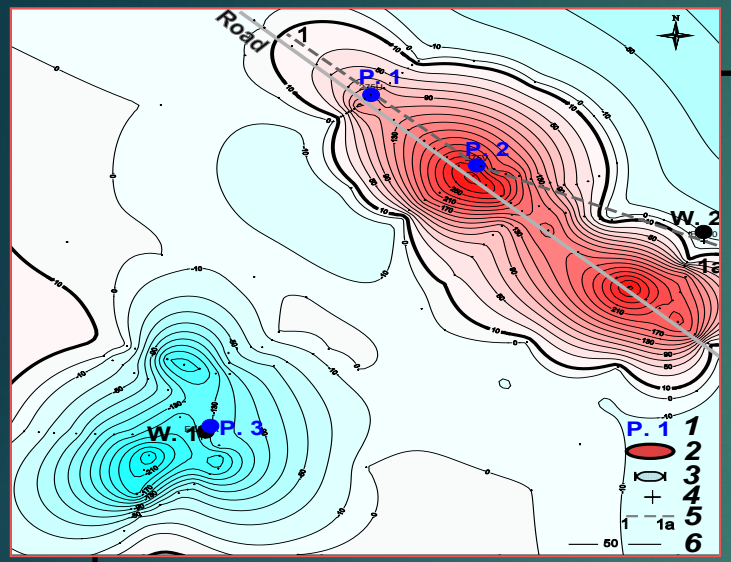
At this stage our team takes data in land (terrestrial version) within the limits of electromagnetic anomalies found , to relate them along the ground and the depth and to define its nature.

First computer in Kiev, 1956

Modern technology

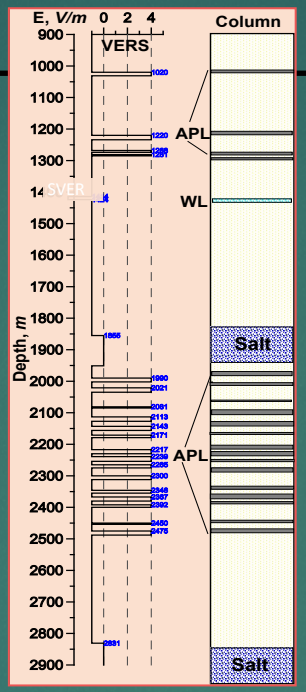
Technology

THE METHOD OF VERTICAL ELECTRIC-RESONANCE SOUNDING (VERS)

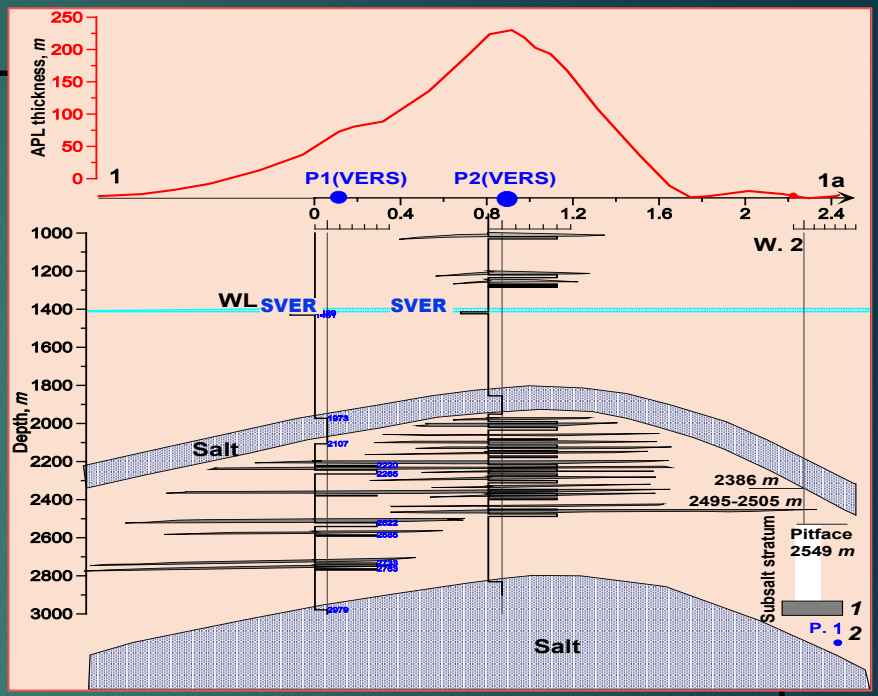


Map of areas with geological anomalies such as "oil deposits", Oilfield Korsak Satybaldy- Russia

1 - VERS points
2 - Zone of subsalt deposits
3 - Area with water-saturated layers
4 - Points for sending / receiving signals
5 - Cross section lines
6- Effective power Isolines of intervals with subsalt deposits.



Vertical sounding



Cross section along line 1-1ª in geoelectric anomalies zone

1 – Zone with "oil deposit" anomalies
2 – Points VERS

Technology

THE METHOD OF VERTICAL ELECTRIC-RESONANCE SOUNDING (VERS)

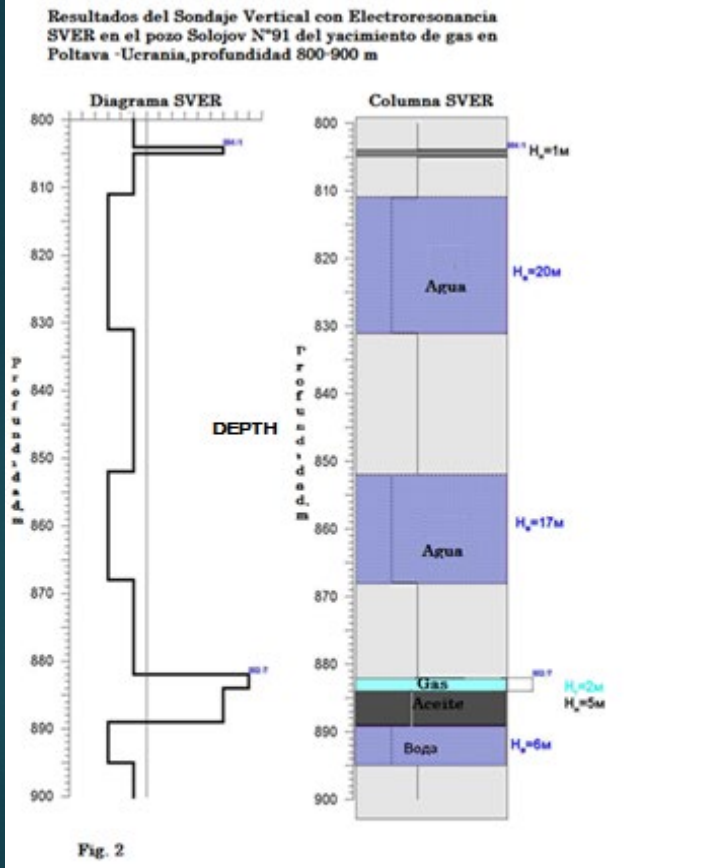


Fig. 2

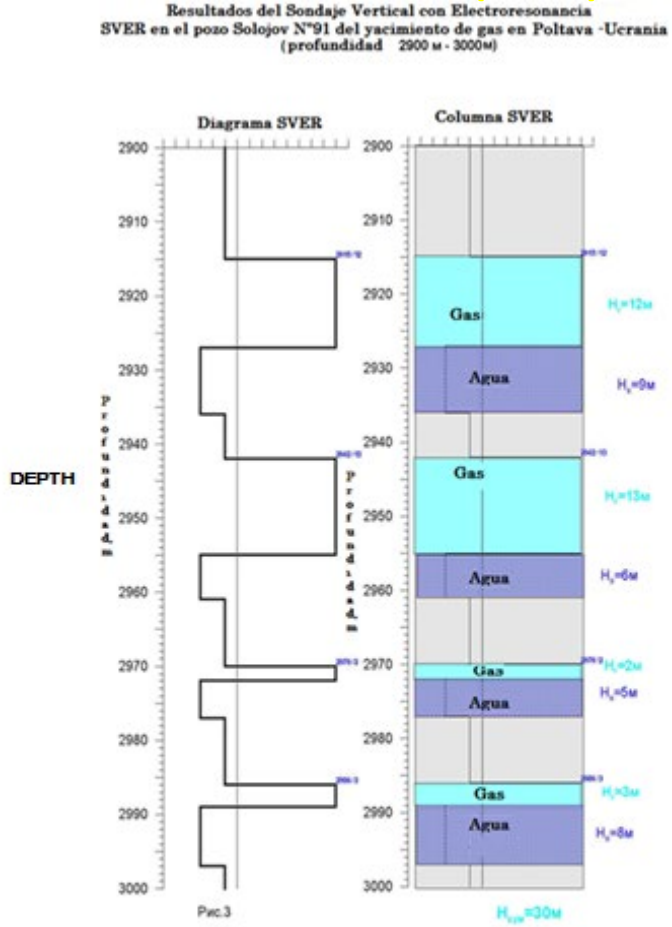
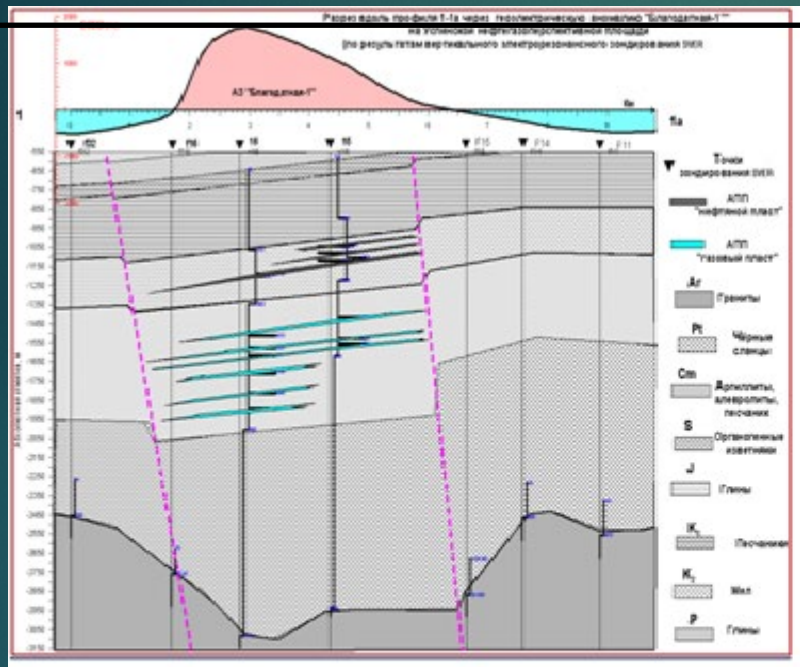


Рис.3

Results of the interpretation of the data obtained by VERS, made in the most characteristic points of the anomalies mapped.

Technology

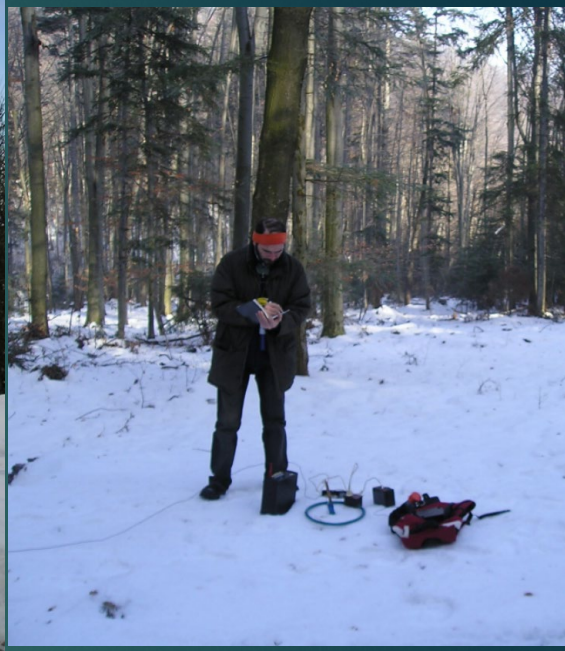
THE METHOD OF VERTICAL ELECTRIC-RESONANCE SOUNDING (VERS)



Transverse section using VERS

Example of cross sections along the profile of anomalies mapped using VERS

Company Profile
Who are we?



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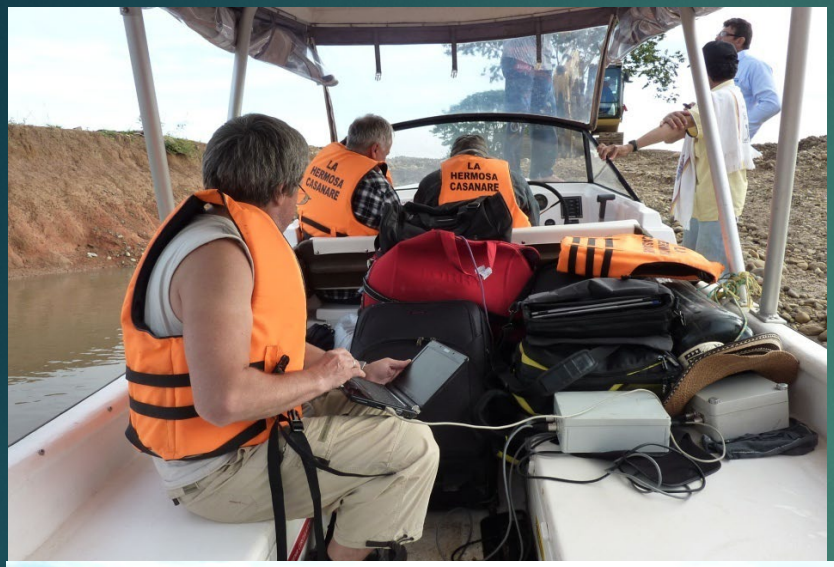

Company Profile
Who are we?

Our laboratories

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Applications

- Advanced remote sensing technology for reconnaissance and/or detailed geophysical surveys, initially requiring no field works.
- All Ground Geoprom survey techniques are rapid and cost effective compared with existing approaches.
- Surveys are non-intrusive, and can be carried out in all environmental conditions.
- Effective through water, ice and snow.
- In mineral exploration, our techniques can be used to remotely identify all the mineral components within a buried deposit.
- Maximum depth of investigation is 8 km using the VERS technique.
- Unmatched resolution and accuracy.
- Professional and detailed reporting

Applications

- In combination these three techniques provide solutions to the problems of natural resources exploration, civil engineering, environmental investigations, groundwater surveys, archaeological site investigations, etc.

- The techniques can also be used independently, depending on the specific needs of the client.

Applications

Natural Resources Exploration

Hydrocarbons

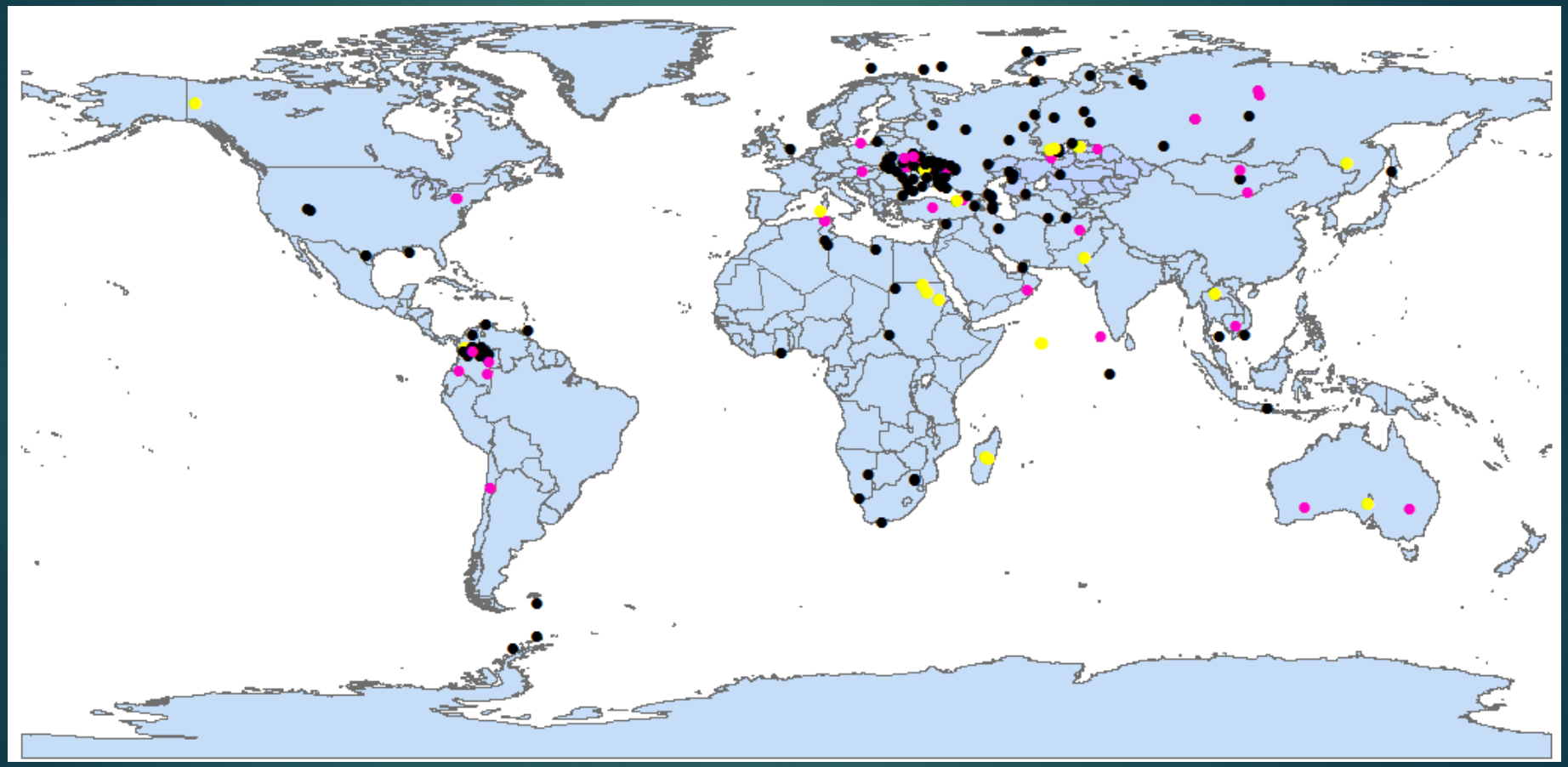
- High resolution, precise solutions for hydrocarbon exploration.
- Identify and define oil and gas deposits.
- Oil, gas and coal resources estimation.

Minerals

- Reconnaissance and detailed geophysical exploration of mineral deposits occurring in igneous, sedimentary and metamorphic terrains, including structurally controlled and superficial deposits.
- Remote identification of specific mineral commodities in buried deposits without the need for sampling and chemical analysis.
- Mapping of wall-rock alteration, volcanic sedimentary layers, and intrusions of various ages and compositions.
- High resolution and precise prospectivity maps.
- Minerals: Au, Fe, Pb, Zn, Cu, U, Co, Ni, PGEs, bauxite, kimberlite pipes, etc.

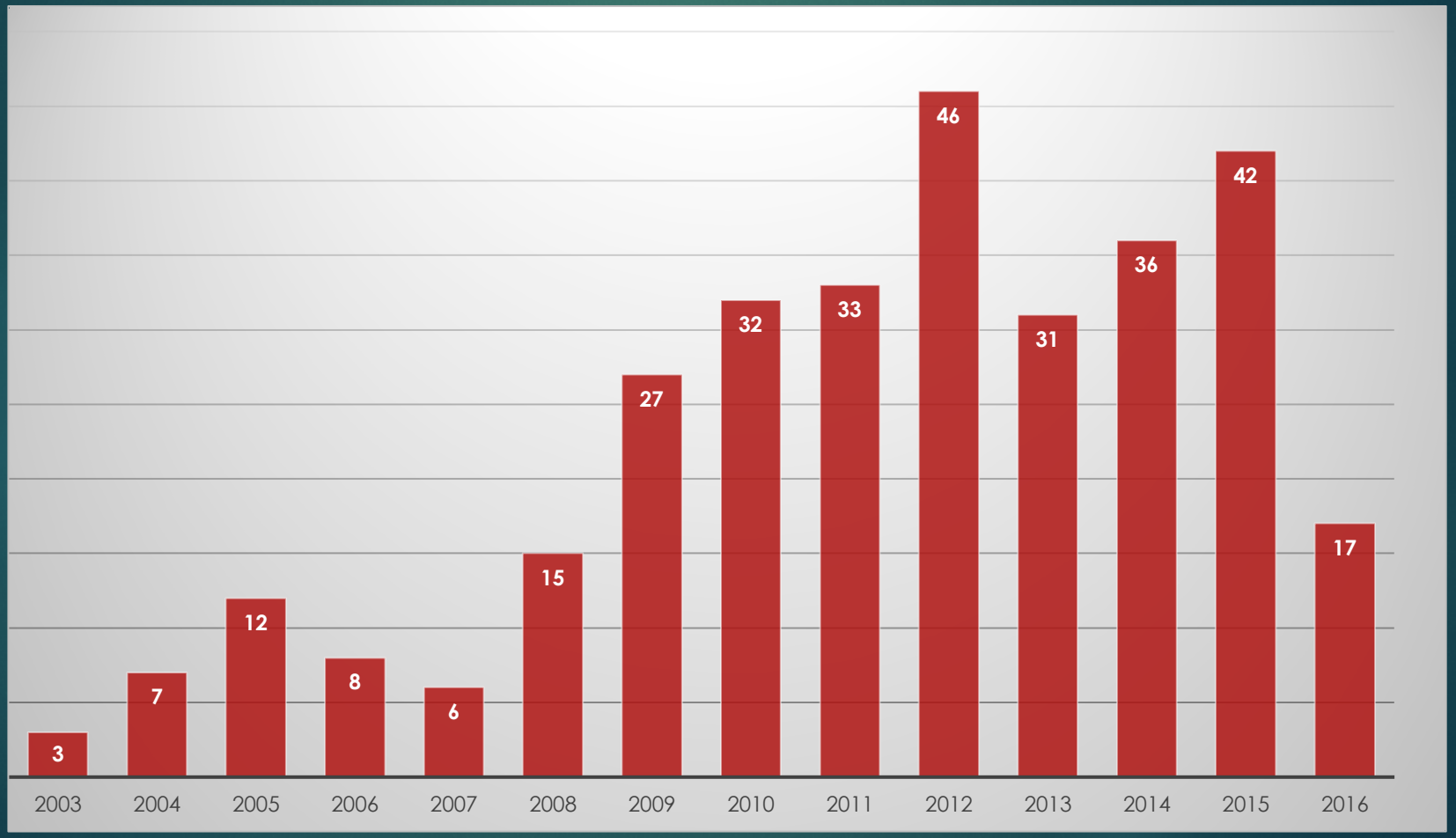
Applications

The geography of our work in the world



Applications

The quantity of our work in the world



Applications

The geography of our work in the world

Ukraine	96
Russia	30
Kazakhstan	**21**
Colombia	15
Sudan	7
USA	5
Mongolia	4
South Africa	4
Tunisia	4
Turkey	4
Antarctic Peninsula	3
Australia	3
Bulgaria	3

Afghanistan	2
Belarus	2
Chile	2
Guyana	2
Madagascar	2
Mexico	2
Norway	2
Vietnam	2
Armenia	1
Cambodia	1
Canada	1
Ecuador	1
Falkland	1
Georgia	1
Ghana	1
Indonesia	1

Libya	1
Lithuania	1
Namibia	1
Oman	1
Poland	1
Portugal	1
Romania	1
Slovakia	1
Syria	1
Trinidad and Tobago	1
Turkmenistan	1
UAE	1
UK	1
Uzbekistan	1
Venezuela	1

Applications

Our clients

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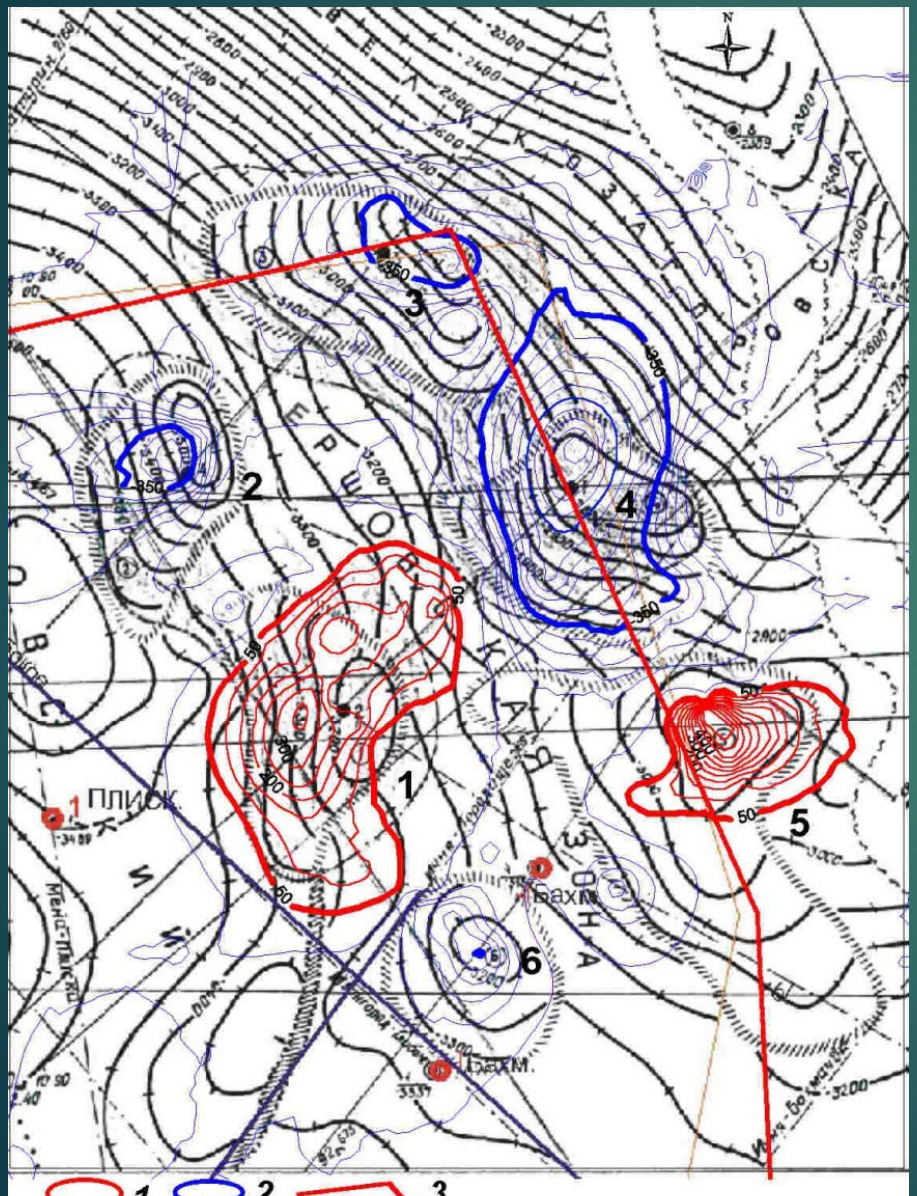
Natural resources

The study of seismic structures



Early in our works survey.

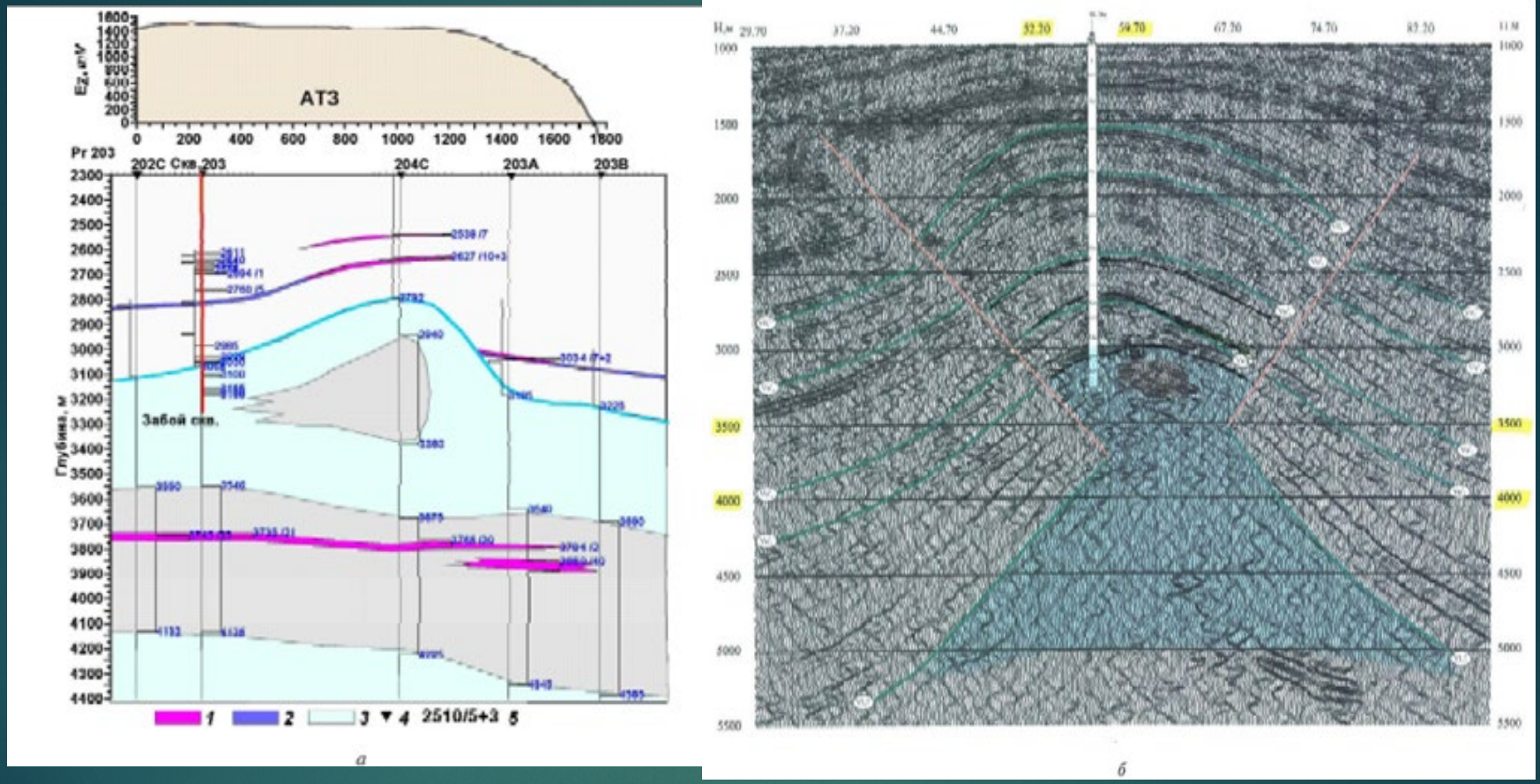
2002. In Ukraine.

Promising seismic structures that are ready for prospecting drilling.

We conduct aerial FSPEF survey.

Received data show, that it is necessary to conduct further detailed geophysical investigations only within structures #1 and #5.

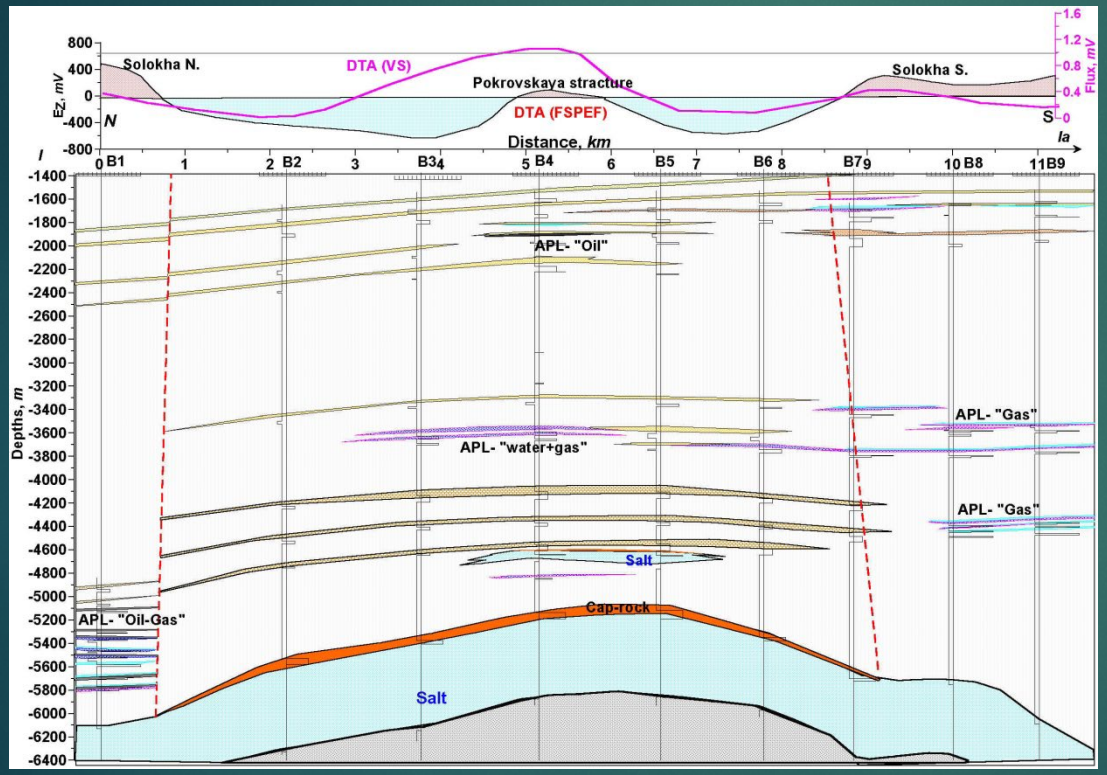
ZAPADNO RADCHENKOVSKIY BLOCK



COMPARISON RESULTS with SEISMIC 2D

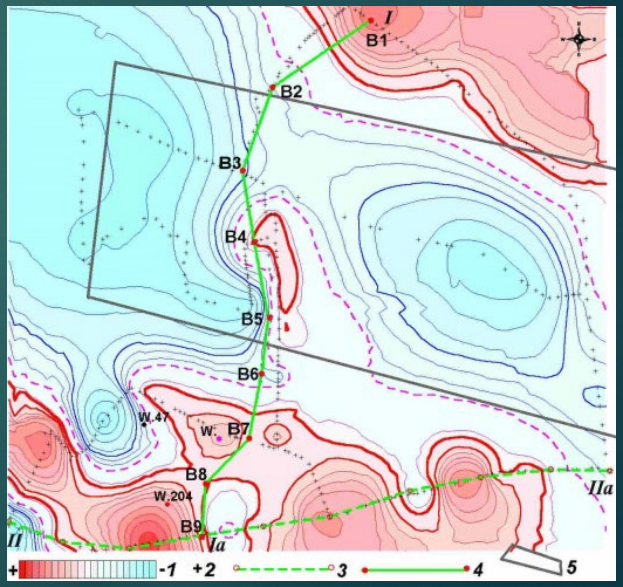
Natural resources

The study of seismic structures



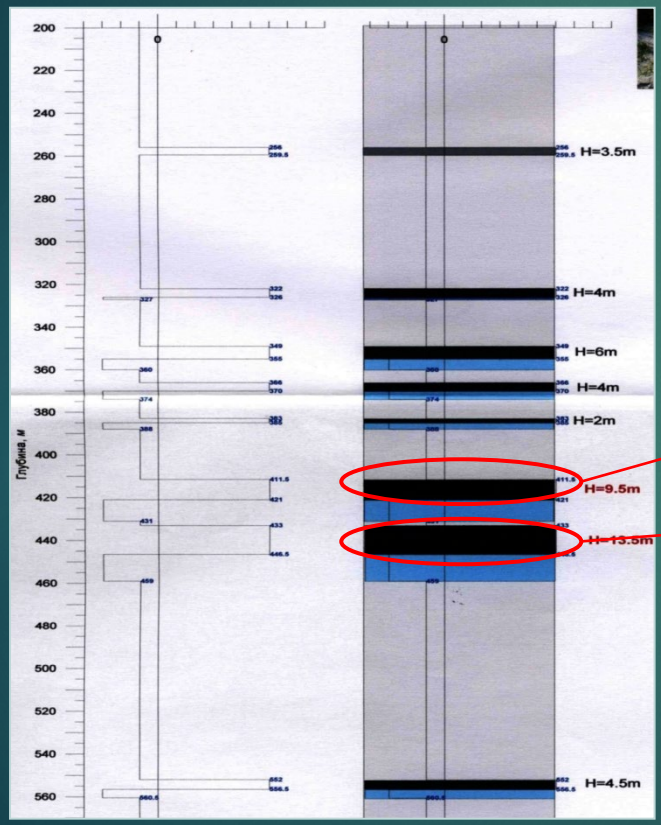
Conclusion. It is inexpedient to drilling the borehole in this area on geoelectric data.

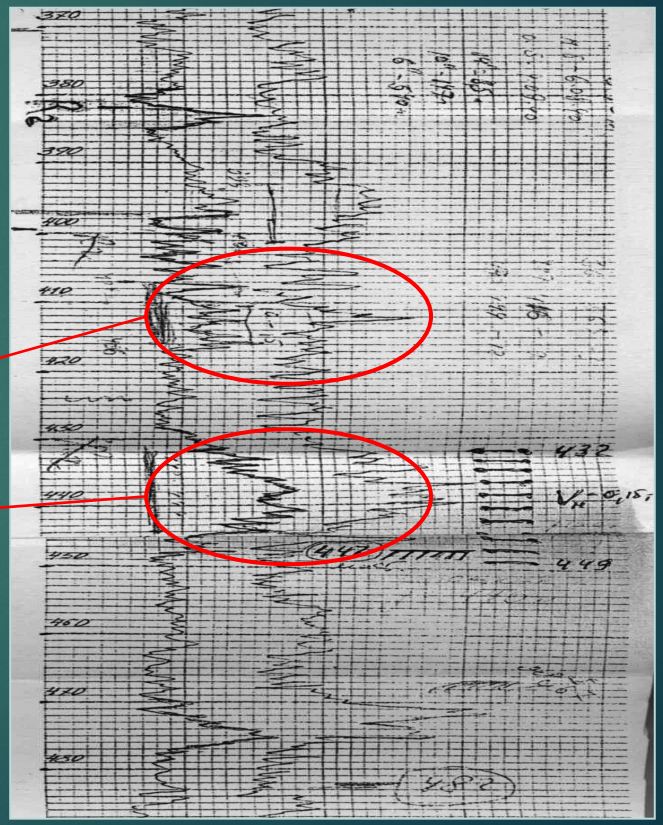
The investor refused from well boring of 5500 m depth



MOSHKAREVSKY OILFIELD, Ukraine

Correlation of the results of VERS and electrical recording of well № 1 in the sector № 1 (N 45 ° 08'32, 7 ″ E 35 ° 42'57, 2 ″)





OLJOVSKIY OILFIELD, Ukraine

Correlation of VERS results and well log № 4

(N 48°50´31,6˝ E 24°12´37,2˝