SPG and APG jointly organized a technical webinar on innovative Resonance Spectral Sensing (RSS) technology for hydrocarbon and mineral exploration


The webinar session commenced with a brief welcome address by ED-Basin Manager and Patron SPG, Shri P. R. Mishra. He welcomed the guest speaker and exhorted the young executives for a proactive and a research-oriented approach.

The technical presentation aimed to share knowledge and expertise amongst the geo-scientific community and adopt new technologies for hydrocarbon exploration developed around the globe.

The innovative RSS technology is based on principle of resonance which allows direct identification and recording subsurface hydrocarbon, mineral deposits, and underground fresh and thermal waters through inspection of analogue infrared space images.

Test wafers are used as a resonator during radiation-chemical processing of analogue aerospace photographs of the territory obtained in the infrared range of electromagnetic spectrum (Figure 1). Using aerospace images of the sites from different satellites obtained at different angles of elevation.

Figure 1: Photograph test wafer X-ray film.
The technology uses aerospace photographs of the surveyed territory obtained at different angles of gradient $\alpha$ and $\beta$ from satellites 1 and 2 (Figure 2). Coordinates of points 1 and 2 can be obtained from different satellites. The distance “a” between points 1 and 2 can be estimated on the surface of the earth. In triangle 1-2-3 (Figure 2), the value of “h” occurrence depth of a horizon can be estimated from known parameters of “a” and adjacent to it angles $\alpha$ and $\beta$.

![Figure 2: Simplified diagram for a depth measurement scheme.](image)

The technology has no restriction on terrain and thus works effectively in thick forest cover, marshy lands, transition-zone areas, sub-basalt covers, besides onshore and the offshore areas. The depth of research provides from 0 to 7 km with an efficiency of more than 90%. The duration of the survey takes up to 2 months. The survey doesn’t require any fair-weather window to work. The method is absolutely safe for people and the environment.

The result of RSS technology survey provides the initial detection and delineation of hydrocarbons in the area, updated ground contours of deposits, definition of maximum response zones, identification of fault zones controlling deposits, determination of the number of deposit horizons, their thickness and depth, clarification of reservoir contours, presence of gas caps and pressure in them, watering horizons, transverse and longitudinal sections of deposits, 3D model, calculation of forecast deposit resources and perspective points for drilling wells.