

USE OF ANTENNAE STANDING WAVE COEFFICIENT MEASUREMENTS FOR DETERMINING AN ANISOTROPIC MEDIUM OVER HYDROCARBONS

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Abstract

The paper presents a study of the standing wave coefficient of antennas for detecting an anisotropic medium over hydrocarbons. Experimental studies were carried out on real hydrocarbon fields. The results of conducted tests confirmed the increase in accuracy of hydrocarbon deposit boundaries determination on the basis of antennae standing wave ratio measurements by 20 - 30 %. The obtained results can be used in prospecting geophysics for increasing the accuracy of determining boundaries of deposits by measuring antennae standing waves ratio in a wide range of frequencies and for increasing resolving power of deposit positioning by measuring standing waves ratio of two or more antennas.

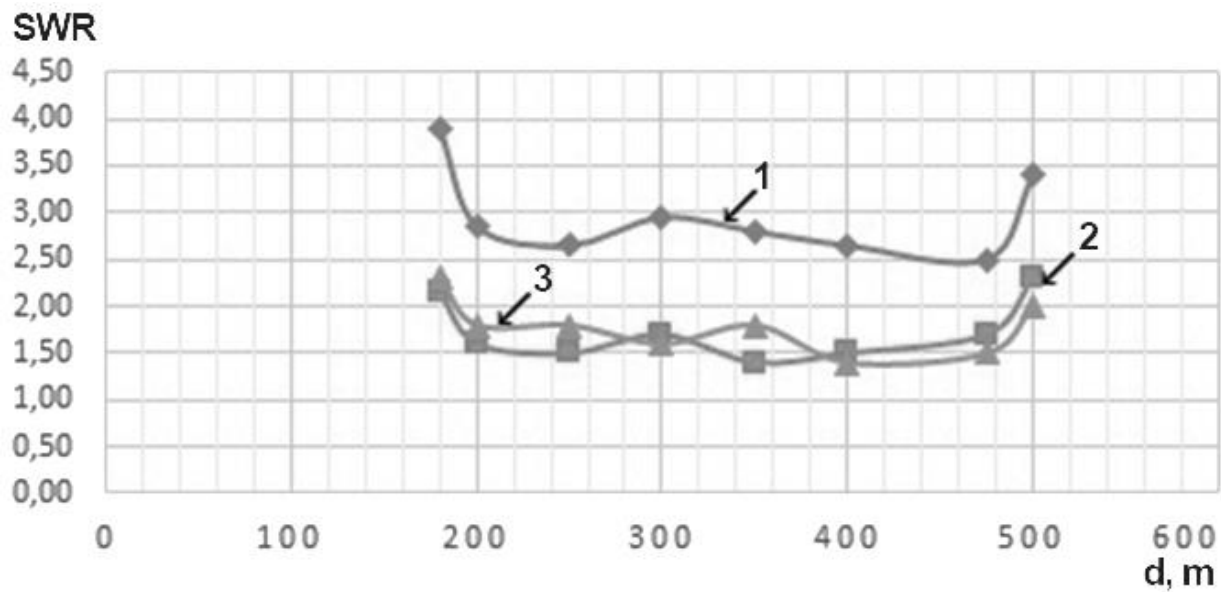


Figure 2 - Experimental dependencies of SWR antenna for Geological field

1 - at a frequency of 1.7 GHz;
2 - at a frequency of 2.5 GHz;
3 - at a frequency of 3.0 GHz.

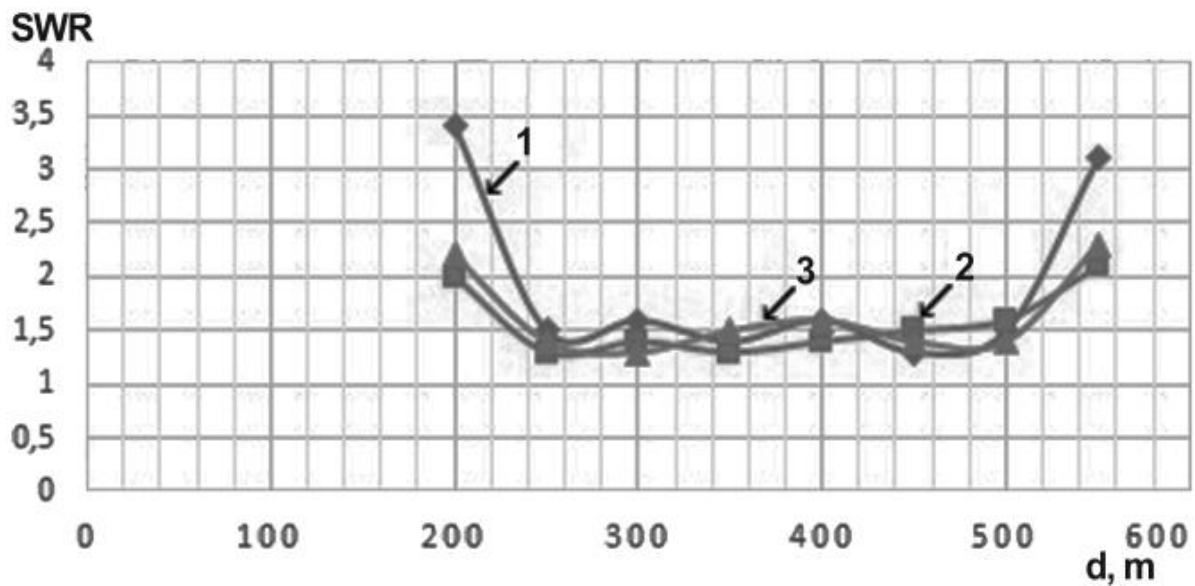


Figure 3 - Experimental dependencies of SWR antenna for Rechitsa field

1-at a frequency of 1.7 GHz;
2- at a frequency of 2.5 GHz;
3- at a frequency of 3.0 GHz.

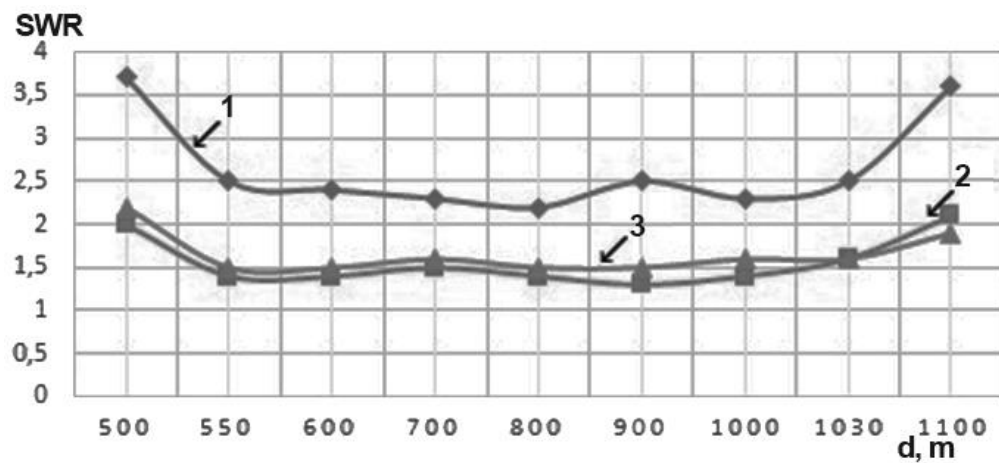


Figure 4 - Experimental dependencies of SWR antenna for Yuzhno-Tishkovskoye field
 1-at a frequency of 1.7 GHz;
 2- at a frequency of 2.5 GHz;
 3- at a frequency of 3.0 GHz.

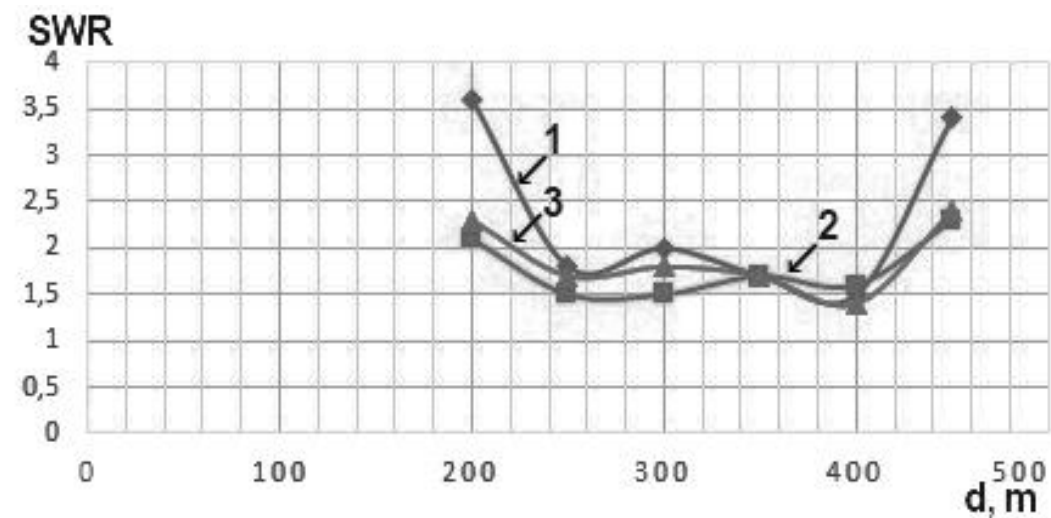


Figure 5 - Experimental dependencies of SWR antenna for Marmovichi field
 1-at a frequency of 1.7 GHz;
 2- at a frequency of 2.5 GHz;
 3- at a frequency of 3.0 GHz.

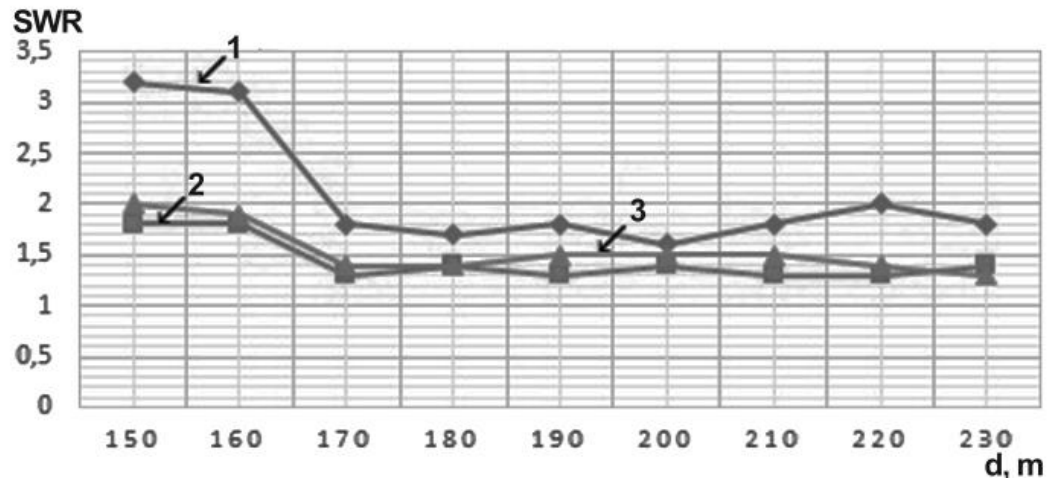


Figure 6 - Experimental dependencies of SWR antenna for Osipovichi underground gas storage

- 1- at a frequency of 1.7 GHz;
- 2- at a frequency of 2.5 GHz;
- 3- at a frequency of 3.0 GHz.

Conclusion

The advantages of the proposed method compared to existing similar ones are:

- improving the accuracy of deposits positioning by measuring SWR in a wide frequency range;
- improving the resolving power of deposits positioning by measuring SWR of two or more antennas;
- improving weight-dimension factors of antennas;
- improving geological exploration performance.