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METHOD INTERSTRIPATION OF THE FUNCTIONS FOR PROCESSING AEROSPACE SENSING AND ITS APPLICATION IN SEISMIC TOMOGRAPHY

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Seismic exploration is the most widely used method of exploration of oil and gas [1-5]. But its effectiveness factor is anything that only 4 of the 10 wells drilled on the recommendation of seismic confirm the prognosis [5]. This report is devoted to research opportunities for improving the efficiency of seismic method by interstripation [6-7] together with remote sensing data planet.

Definition 1. Let in the plane Oxy defined system of bands (stripes) $\Pi_k = \{(x,y): a_k \le w_k(x,y) \le b_k\}$, $w_k(x,y) = A_k x + B_k y - C_k; A_k^{\,2} + B_k^{\,2} = 1;\ k = \overline{1,M}$,

Let $\Pi_k \subset D \subseteq R^2, k = \overline{1,M}$ and some function $f(x,y) \in C(D)$ are defined only in the points these stripes by their tracks $f_k(x,y) = f(x,y), (x,y) \in \Pi_k,\ f_k(x,y) = 0, (x,y) \notin \Pi_k k = \overline{1,M}$. The interstripation of the function $f(x,y)$ is the recovery $f(x,y)$ between the stripes by their tracks on $\Pi_k, k = \overline{1,M}$. The report proposed a method of using interstripation data processing aerospace sensing planet to improve the quality of seismic exploration. We consider in detail cases where remote sensing data is a world in which the function $f(x,y)$ can mean the color of vegetation and soil surface, the height of the planet's surface at a point relative to sea level and so on.

For this report examines such tasks.

Task 1. Select automatically in D the subregion $D_1 \subset D$, in which the color of vegetation is beneficial for the planet beneath deposits of oil or gas.

Task 2. Select automatically in D the subregion $D_2 \subset D$ in which the shaft - the result of tectonic shifts crust of the planet.

Task 3. Develop recommendations for the use of problem solving tasks 1 and 2 to improve seismic taking into account some statements [5] and the work of other authors.

Bibliography

1. Guust Nolet. A breviary of seismic tomography. Cambridge University Press. - 2008. – 344.
2. P.Shearer P. M. Introduction to seismology. Cambridge University Press. Cambridge, UK, 2009. - 412 p.
3. Stein S. and Wysession M. An introduction to seismology, earthquakes and Earth structure. Blackwell, Malden, USA, 2003. – 512 p.
4. Sergienko I.V., Deineka V.S., Lytvyn O.M., Lytvyn O.O. Method interstripation vector functions on the system vertical direct and its use in between boreholle seysmic tomography / Proceedings WCIPT- 7.
5. Trofimov D.M., Evdokymenkov V.N., Shuvaeva M.K. Modern methods and algorithms handling and analysis of complex kosmycheskoy, geological and geochemical heofyzycheskoy of information and forecast for hydrocarbon potentsiala neyzuchennыh plots of mineral resources. Moscow: Fyzmatlyt, 2012. - 320 p. (in russian).
6. Lytvyn O.M. Interlineation functions and some of its applications. Kharkov: Basis, 2002.-544 p. (in ukrainian).
7. Lytvyn O.M., Matveeva S.Y. Monitor aerospace images with help interstripation functions of two variables / Problems of Informatics and Control , 2013. P. 111-124.(in russian).