



New Method of active electromagnetic induction and seismic Monitoring in Oil saturated Media

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It is provided a comparison of no equilibrium effects by independent hydro dynamical and electromagnetic induction influence on an oil layer and the medium, which it surrounds. It is known, that by drainage and steeping the hysteresis effect on curves of the relative phase permeability in dependence from porous medium water saturation by some cycles of influence: drainage-steep-drainage is observed. In earlier papers the analysis of the seism acoustic monitoring data in regimes of phone radiation, response on the first influence of given frequency and on the second influence is developed. For the analysis of seism acoustic response in time on fixed intervals along the borehole an algorithm of phase diagrams of the state of many phase medium is suggested. On the base of developed algorithm a new algorithm of analyze of space, but integral in time for equal observation periods changing by the method of phase diagram state of many phase medium in the oil layer is developed. The developed method allows on quality level to classify the state of the polyphase medium, which is the oil layer, using data of many cycles influence. In that paper we suggest the algorithm of modeling of 2-d seismic field distribution in the heterogeneous medium with hierarchic inclusions. Using the developed earlier 3-d method of induction electromagnetic frequency geometric monitoring we showed the opportunity of defining of physical and structural features of hierarchic oil layer structure and estimating of water saturating by crack inclusions. That allows managing the process of drainage and steeping by water displacement the oil out of the layer. Thus, the developed methods allow on the quality and quantity levels to make a classification of the many phase medium, which is an oil layer, using data for multiple excitation. For quantitative solution of earlier listed events of no equilibrium and hysteretic interaction of water and oil by out working of the oil layer, it is urgently to add and to further develop the system of seism acoustic and electromagnetic observations.

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