

WAVE PROCESSES IN POROUS MEDIUM CONTAINING GAS HYDRATE

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The system of equations of motion of porous medium containing gas hydrate is obtained.

In the suggested model hydrate is considered as an individual phase and is characterized with its own velocity and stress. Thus, the skeleton of such porous medium consists of contacting grains of two different materials, ground grains and hydrate grains. There are three phases in such porous medium: skeleton grains, hydrate grains and fluid.

The effective stress of the skeleton of such three-phase porous medium is introduced. The constitutive equation of elastic two-phase skeleton is derived. It is the dependence of effective stress of skeleton on strains of skeleton and hydrate and on fluid pressure.

Wave propagation in hydrate containing porous medium is numerically investigated. It is also numerically studied wave transition and reflection at the boundaries between fluid and hydrate containing porous medium, usual porous medium and hydrate containing porous medium.

The suggested set of equations allows investigation of wave processes in hydrate containing porous medium without phase transitions. It is an actual problem for the detection of gas hydrate reservoirs.

Key words: porous medium, gas hydrate, acoustic wave.