



The research of the impact of the contrast of reservoir parameters on hydraulic fracture propagation

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In this paper we investigate numerically fracture growth in the formation under three-dimensional conditions. The formation consists of three horizontal layers, the formation parameters in the outer layers differ from the parameters in inner one. The impact of the stress contrast, the elastic modulus and crack resistance on the geometric shape of the fracture was studied. During the computational experiment, it was found that after the penetration of a crack through the interface between the layers its growth in the vertical direction decreases, even with a relatively small stress contrast, and extends infinitely in the horizontal direction. When Poisson's ratio contrast takes place the cracks remains round. While pumping the proppant and in the presence of leaks in the formation the final geometric dimensions of the cracks, in particular the aspect ratio, are very sensitive to the external parameters. In case without the proppant the gradual closing of crack in the upper and lower parts could be observed even with continued injection of fracturing fluid.