



Investigation of growth features in several hydraulic fractures

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In this paper we simulate the growth of three or more interacting hydraulic fractures in the horizontal well with a cross flow of fluid between them. Calculation of the dynamics of cracks is performed in three dimensional space. The computation of the movement of fracturing fluid with proppant is performed in the two-dimensional space (the flow was averaged along crack aperture). For determining the hydraulic pipe resistance coefficient we used a generalization of the Reynolds number for fluids with power rheology and a generalization of the von Karman equation made by Dodge and Meiner. The calculations showed that the first crack was developing faster than the rest in homogeneous medium. During the steady loading the outer cracks pinch the inner cracks and it was shown that only the first and last fracture develop in extreme case. It is also possible to simulate the parameters at which the two developing outer cracks pinch the central one in the horizontal direction. In this case, the central crack may grow in the vertical direction.