

Numerical Modelling of Crack Initiation around a Wellbore Due to Explosion

Authors : Meysam Lak, Mohammad Fatehi Marji, Alireza Yarahamdi Bafghi, Abolfazl Abdollahipour

Abstract : A wellbore is a hole that is drilled to aid in the exploration and recovery of natural resources including oil and gas. Occasionally, in order to increase productivity index and porosity of the wellbore and reservoir, the well stimulation methods have been used. Hydraulic fracturing is one of these methods. Moreover, several explosions at the end of the well can stimulate the reservoir and create fractures around it. In this study, crack initiation in rock around the wellbore has been numerically modeled due to explosion. One, two, three, and four pairs of explosion have been set at the end of the wellbore on its wall. After each stage of the explosion, results have been presented and discussed. Results show that this method can initiate and probably propagate several fractures around the wellbore.

Keywords : crack initiation, explosion, finite difference modelling, well productivity

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