



Hydraulic Fracturing in Layered Media

Salimzadeh, Saeed; Kadeethum, Teeratorn; Nick, Hamid M.

Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

Citation (APA):

Salimzadeh, S., Kadeethum, T., & Nick, H. M. (2017). *Hydraulic Fracturing in Layered Media*. Abstract from Danish Hydrocarbon Research and Technology Centre Technology Conference 2017, Lyngby, Denmark.

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

Danish Hydrocarbon Research and Technology Centre Technology Conference 2017

Hydraulic Fracturing in Layered Media

Saeed Salimzadeh, Teeratorn Kadeethum, Hamid M. Nick

Danish Hydrocarbon Research and Technology Centre, Technical University of Denmark, Lyngby, Denmark

Hydraulic fracturing has been proven as an efficient method to improve recovery from unconventional reservoirs and also a potential method for improving the sweep in the North Sea chalk reservoirs. While the majority of the published research focus on a single (or multiple) fracture(s) in a homogenous, single layer rock, it is evident that the real reservoirs are consisted of multiple, soft and stiff layers, which makes the hydraulic fracturing process more complex (Figure 1). When a hydraulic fracture hits an interface, it can be arrested at the interface, or the new layer can act as a favourable medium for the fracture to grow in. In this study, hydraulic fracturing process through multiple layers is investigated using a robust finite element code, CSMP. Different layers in the model have different mechanical properties, thus the stress distribution is not continuous across interfaces and that discontinuity affects the growth direction and the size of the hydraulic fracture in each layer. The hydraulic fractures are assumed to propagate under toughness regime, so the fracture toughness of each layer is also affecting the propagation direction and the shape of the induced fracture. A sensitivity analysis on the governing parameters is performed and the results are presented. The outcomes of this research can be instrumental in designing the hydraulic fractures in the chalk reservoirs in the Danish North Sea.

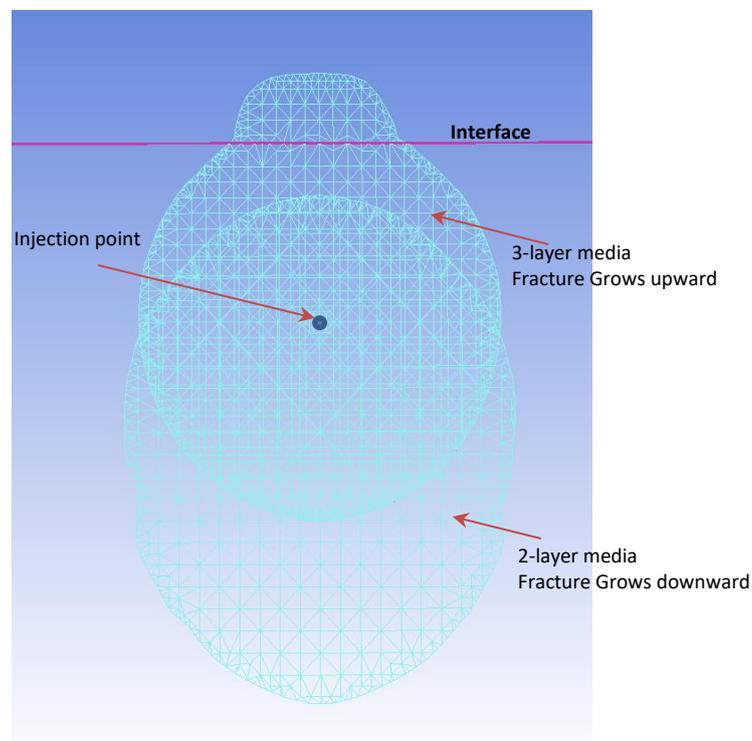


Figure 1- The shape of the hydraulic fracture is affected by the layers' thickness