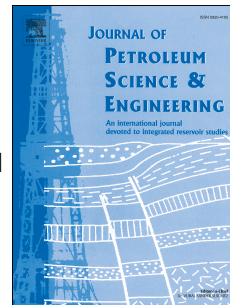


# Accepted Manuscript

Characteristics of transient production rate performance of horizontal well in fractured tight gas reservoirs with stress-sensitivity effect

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1 Characteristics of transient production rate performance of horizontal well in fractured  
2 tight gas reservoirs with stress-sensitivity effect

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13 Abstract

14 Interest in tight gas reservoirs (TGR) has quickly spread worldwide. Most  
15 researches on the permeability stress-sensitivity of tight gas reservoirs mainly  
16 concentrated on experimental approach, physical modeling or pressure behavior  
17 analysis, while transient production rate performance does not attract much attention.  
18 This study developed a dual-porosity model of a horizontal well in fractured tight gas  
19 reservoirs considering the stress-sensitivity effect. The solution methods include  
20 variable substitution, perturbation technique, Laplace transformation, Sturm-Liouville  
21 eigenvalue theory, orthogonal transformation and numerical inversion. The results  
22 showed that the production rate decreases with the increasing of permeability modulus  
23 and the derivative curve will be warped up during the whole system late radial flow  
24 stage. The influences of other parameters are also analyzed. The work undertaken here  
25 has both theoretical and practical significance in predicting production performance  
26 and evaluating underground fluid transport in such formations.

27 Key words

28 Transient production rate performance; dual-porosity; stress-sensitivity; horizontal  
29 well; tight gas reservoir

30 1. Introduction

31 Unconventional resources have played an increasingly important role in the  
32 energy revolution. Interest in tight gas reservoirs (TGR) has quickly spread worldwide.  
33 Numerous studies on the transient flow analysis of unconventional resource have been  
34 documented extensively in the literatures. For naturally fractured reservoirs, the most  
35 common Warren-Root model was proposed in 1963 (Warren and Root, 1963), as well

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