

## Research on the expansion mechanism of hydraulic fracture branching induced by weak bedding shear slip

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### ABSTRACT

Bedding fracture is the main rock mass of the tight reservoir; the main method for the formation of complex fractures of dense rock is to activate weak bedding to induce the branch extension of hydraulic fracture. Based on fracture mechanics, this paper established the mechanical model of coupled extension with weak bedding when the hydraulic fracture is close to the weak bedding process, adopted the numerical analysis method, based on the equivalent principle of coupling, through unit compilation techniques, and realized the numerical simulation of the expansion of hydraulic fracture and weak bedding. The results show that the hydraulic fracture tip passivation is induced by shear slip of weak bedding plane; the increase of shear stress in the weak bedding is the main control mechanism of the expansion of hydraulic fracture; the closer the approaching angle, the greater the elastic modulus of reservoir, and the lower the stress difference, the more difficult it is to induce weak bedding shear damage. The greater the viscosity of the fracturing fluid, the greater the displacement, the more prone to inducing shear damage of weak bedding plane, and the more complex the formation of cracks.

*Keywords:* Dense reservoir; Weak bedding; Shear fracture; Fracture network; Numerical simulation

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