

НАПРЯЖЕННОЕ СОСТОЯНИЕ МАССИВА  
**STRESS FIELD OF A MASSIF WITH A SHEAR FRACTURE IN A  
NON-HOMOGENEOUS INITIAL STRESS CONDITIONS**

**A.S. Lermontova**

*Schmidt Institute of Physics of the Earth of the Russian Academy of Sciences,  
Gruzinskaya str., 10-1, Moscow, 123995, Russia*

According to different field measurements, a fault sides displacement in real rock massifs usually occurs in non-homogeneous stress conditions. We solve a problem of two-dimensional elasticity theory on a single shear fracture in a non-homogeneous initial stress field. We give formulas for the shear jump function and final stress field parameters in a neighborhood of the fracture for arbitrary initial conditions, which may vary along the fracture. In order to illustrate the method, we compute the stress fields for different initial stressed states. The stress field components are shown for a subvertical fracture, where the initial compression increases with depth due to the gravity. The proposed method allows us to compute the shear jump function for horizontal surface faults if the initial stress field is known, and to compute the contribution of activation of the fault to the final stress field if we know the fault sides displacement. Besides, the article provides an example of using our method for finding the stress field of a massive, which contains a set of arbitrarily located and sequentially activated fractures.

*Keywords: stress field, elasticity, fracture, stress drop, shear jump.*