

RESPONSE OF SOIL LAYER'S SURFACE TO BLAST LOAD ACTION AT THE ROCK BASE

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The paper presents an investigation on the behavior of a soft soil layer above a rock bed that is subjected to blast loading. The investigation analyzes the blast wave transmission from a rock medium in which the explosion occurs to the soft soil layer covering the rock base and the layer's free surface response. The paper presents the numerical algorithm that was developed to simulate the shock wave propagation within the medium, considering both the bulk and deviatoric damage and taking into account the possible shear damage accumulation. It takes into account the contact conditions between the layers to simulate the shock wave transmission and the layers interaction including their possible separation. Two types of the soil models were investigated – an ideal elastic plastic medium and an irreversible compressible medium with failure in bulk tension - and the results were compared with each other. The analysis of the free surface and interface displacements, velocities and accelerations as well as the contact stresses, the damage and separation zones at the media interface were carried out. The analysis assumes a constant charge cover that is subdivided between the rock mass and the soil cover layer. The effects of the relative cover thickness on the interface and free surface behavior is studied.