

Abstract

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Parametric Study for Circular Tunnels Without Lining Subjected to Under Ground Explosion Load in Rock Media

Development and evaluation of a reliable explosion design method for rock tunnel systems require a thorough understanding of the system parameters affecting the tunnels. Also, it is necessary to estimate the value and distribution of the stresses, deformations and damage that are likely to occur due to the expected explosion load. Accurate modeling of the complex tunnel response requires a large number of constitutive parameters which are often difficult to integrate into an analytical semi-analytical closed form formulation. In this study, the numerical analysis is carried out using finite element technique, the commercial software package, AUTODYN, version 4.3 was used to perform three-dimensional nonlinear dynamic analysis used in this study. This program is probably the most extensively code dealing with explosive loads in the world. The effect of tunnel opening on wave propagation through rock media is studied. Also, a parametric study has been performed for a tunnel in rock media under explosion loads. The main parameters that have been taken into consideration are type of rock, depth of tunnel, and tunnel radius. These parameters have a great influence on the behavior of tunnel in terms of stresses and deformations.