Abstract

Adel M Belal

Field and Numerical Study Of The Effect Of Geotechnical Conditions On Wave Propagation Of Underground Explosion In Rock Mass

Blast-induced ground excitation has a great influence on construction of underground and fortified structures. Understanding the dynamic response and damage characteristics of rock mass due to blast ground motions is essential for safe design for this type of structures. The aim of this paper is to observe the dynamic response of rock mass under blasting vibrations and the effect of different geotechnical conditions of rock mass on the wave propagation of the explosion. In order to achieve this aim, two field experiments were conducted in two rock masses with different geotechnical conditions. An unconfined compressive strength tests were carried out on some rock samples collected from two sites to present the average mechanical properties of the rock masses. Then, Nonlinear three-dimensional numerical simulation of this experimental investigation was carried out to study the rock mass response due to explosion based on inherent mechanical properties relative to intact rock. A comparison between the results determined by the numerical simulation and the field measurements was performed, the results showed that the geotechnical conditions and the quality of rock mass have a great effect on the wave propagation also, numerical simulation results showed a good compatibility with the field measurements.