

Numerical Simulation of Mine Blast Loading on Structures

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Introduction

The design of vehicles to resist mine blast is of great interest to the international community who would like to provide an appropriate level of protection for vehicles and their occupants. Full size mine blast trials are expensive and time consuming to organise. However, using numerical simulations to predict the interaction of the mine blast with the vehicle can minimize the number of such trials.

This paper describes a mine blast simulation methodology that has been developed within the AUTODYN software^[1]. This methodology can be used with surface-laid or buried charges and calculates both the air blast loads applied to a structure and momentum transfer due to soil or other materials impacting with that structure. The complexity of the target geometry is not limited by the methodology

The results of simulations are compared with experiments conducted by DRDC Suffield using an instrumented horizontal Mine Impulse Pendulum (MIP), as described in two papers presented MABS^{[2],[3]}.

Finally, the methodology is applied to simulating mine blast effects on a complex vehicle structure.