BLAST LOADING OF A SMALL-SCALE BOX-LIKE STRUCTURE COMPARISON OF EXPERIMENTAL RESULTS WITH A SIMPLIFIED THEORY

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The behavior of blast loaded military y equipment is investigated by tests in the free field or in large blast simulators. To get some basic information about blast loaded objects, tests with simplified full-scale or small-scale models for example a box-like structure were done.
So, some years ago, in the EMI-Model-Simulator, which is a small-scale model (1:42) of the large blast simulator of Reiteralpe several box-like structures (48x48x96 mm) have been tested. For incident shock overpressures of 0.3, 0.5, 0.7, 1.0 and 1.2 bar, pressure measurements on different locations at the front, rear, side, top and bottom of the test object were done to get loading functions for further investigations e.g. response analysis. The tests were started first with a model placed on the ground and after that with the same model but put on four stilts as simulation of a military truck.
To control scaling laws these experiments also were done with a block of 2x2x4 m in the large simulator of Reiteralpe and are in good agreement with EMI results.
With numerical codes on principle it is possible to calculate the loading of all surfaces for an incident blast wave. Since these calculations can be very extensive, we tried to estimate the average loading using an existing simplified theory, developed by KINNEY [31,[41,[5]. For a box-likestructure rigidly attached to the ground and one side facing to the blast
wave, the average loading of all surfaces has been calculated and compared with the experimental results.