NUMERICAL SIMULATIONS OF SHOCK WAVE TARGET INTERACTION A SHARC TWO-DIMENSIONAL COMPUTATION VALIDATION

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Many studies of material hardening to the shock wave effects require knowledge of the structure loading. This can be gotten by experiments, but this way is always very long and expensive. The other usual way is the numerical simulation of shock wave target interactions. Thus, the Centre d'Etudes de Gramat has used the SHARC hydrocode, a descendant of HULL, for some few years.

In order to use correctly such a code, SEG has decided to validate the numerical simulation of the shock wave diffraction around specific targets. These targets have simple geometric shapes. The Computational results are compared to experimental results, obtained in the laboratory shock tube ZEPHIRE.

This paper proposes the results of one study:
The geometry of the problem is two-dimensional. The section of the target is rectangular.
The incident shock wave is a step function.
The experimental results are pressure signatures measured by a transducer on each face, and flow photographs obtained by schlieren technique.
The efficiency of the code is evaluated by varying parameters one by one between each numerical simulation (mesh, initial conditions, artificial viscosity, incident shock wave level).

Comparison of experimental and numerical pressure signatures are presented.
The result analysis gives information concerning numerical simulations of shock wave diffraction around targets which shape is similar to the present case, with the SHARC code. These information are about the degree of the simulation quality which can be hoped versus the computation cost.