NUMERICAL SIMULATION OF SHOCK AND BLAST WAVE PROPAGATION OVER A POROUS BARRIER

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One of possible techniques for protecting people and objects from damage caused by explosion is to make use of porous barriers which can significantly attenuate propagating shock and blast waves. To investigate this phenomenon, in the present work the interaction of shock and blast waves with a porous barrier is simulated numerically using an unstructured CFD code. The barrier is modeled as a multi-layered regular structure of rigid non-moving cylinders. Simulations are performed for different shock wave Mach numbers, barrier thicknesses and porosities. Both plane and cylindrical shock and blast waves are considered. Figure 1 shows formation of reflected and transmitted shock waves resulted from the unsteady interaction of a M_s = 1.4 plane shock wave with the system of cylinders.

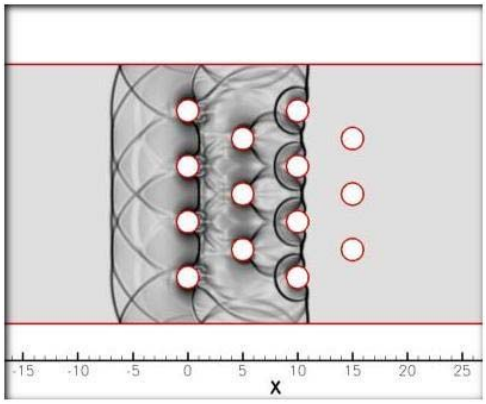

Fig.1. Interaction of a shock wave with a porous barrier.

We plan also to investigate the effect of porous barrier on a detonation wave propagating in a combustible gas mixture.