ENTRY OF SHOCK WAVES IN TUNNELS WITH AXES ORIENTED AT VARIOUS ANGLES TO THE NORMAL

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A considerable amount of work has been done on the interaction of a shock wave with entrance of a tunnel beginning in an infinite wall. For both the side-on and the face-on case the evolution of the peak pressure of the incident wave entering the tunnel have been extensively studied, but, to our knowledge, only for tunnels with axes perpendicular to the surrounding entrance wall.

The main purpose of the shock tube tests performed in Wimmis has been to gain some more experimental insight on this kind of shock wave interaction and propagation for different tunnel entrance angles.
Again the cases side-on and face-on have been considered for the angles 0, 30 and 60 degrees. The shock strength has been varied from 2 to about 10; shock wave profiles were measured with pressure gauges at several points from 0.5 to about 50 diameter along the tunnels axis.

A square tunnel cross section has been chosen because, in our opinion, this approach is more realistic for most of the configurations actually built. In addition we have the possibility of comparing the results with the corresponding ones for circular tunnel cross sections. The results, in form of data sheets, will be included in a manual for the design of protective structures. Detailed experimental results will be presented at the symposium.