PRECURSOR SIMULATION USING A FLOW SIMULATOR

KLAUS,M.H.; DUCKERSCHEIN,R.

We've been using a free field flow simulator for testing pilot equipment in our lab for more than 15 years. The device is called "simulator for aerodynamic effects" (SAE). The driver of the SAE consists of 13 steel tubes which are filled with compressed air up to 200 bar. The simultaneous detonation of the diaphragms that close the tubes provides a high speed air flow with according high dynamic pressures.

The recent interest in the simulation of the precursor effect motivated us to explore the possibilities of using the SAE for this purpose. The reasoning is the well known fact, that the effect of a precursed blast on military targets is predominantly due to the dynamic pressures.

Thus we evaluated in a first step the temporal and spatial behavior of the flow field in the measuring crossection. We discovered shortcomings in the homogenuity of the flow. In order to solve this problem we investigated in a second step the influence of varying driver pressures, having high pressures in the outer tubes and lowering the pressure in 4 steps towards the inner tubes. Experimental results will be presented, as well as theoretical background. Future projects involve increased packing density of the driver tubes and larger driver crossections, as well as time delayed diaphragm opening for pulse shaping.