# USE OF THE SHOCK TUBE FOR GENERATING BLAST WAVES

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The paper reports about the flow phenomena occurring in a conventional air/air shock-tube with a short high pressure section (chamber) and with a low pressure section (channel) of the same cross-section. Whereas an abundance of work prevails dealing with shock tubes whose chamber and channel lengths are in a ratio so that pressures waves with step profiles (shock waves) come into existence the literature is rather poor in the present case in which blast waves are generated. In the free space blast waves are created by a relatively short lasting release of energy as it happens with the detonation of explosive material. If a longer lasting energy release occurs as it is known from nuclear events pressures waves with nearly step profiles arise.

Knowledge of the properties of shock waves and of the loading of structures exerted by them plays an important role in practical applications if one aims up to minimize their destructive effects. Up to now relevant data for long duration shock waves were urgently needed. Even if the nuclear threat may have decreased that one caused by the impact of blast waves undiminishedly prevails in the military domain and in the civilian as well. Therefore it seems to be obvious to study the loading of short duration waves and to elaborate an appropriate simulation technique. The stringent reason for this is that one has to take into consideration that the loading of the same obstacle depends upon the spatial profile of the pressure wave striking it.

It is well-known that in the past many explosive tests in large scale dimensions have been performed in order to study blast wave effects. The main interest was directed to collect measured data and to create data bases also for loaded rigid and deformable objects. But the attention was not primarily drawn on basic considerations as it is achievable when working with a shock tube in the laboratorium with a well equipped instrumentation, i.e. with a visualization system, with piezo-electric pressure measurements and with interferometry. Of course, the objects to be tested can only be of simple geometry and with dimensions so that they fit into the test section. Once more this reveals the aim of this study namely to find out whether the shock tube is usable without greater modifications to produce blast waves instead of shock waves. At first the characteristics of the flow in a shock tube with relatively short but various channel lengths are presented. Finally an example will be given indicating that a non-negligible difference between a shock wave loading and a blast wave loading of the same wedge like obstacle exists.