

# NUMERICAL INVESTIGATIONS OF THE INFLUENCE OF THE CHARGE GEOMETRY ON THE BLAST FORMATION

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Countermeasures based on blast can reduce the damage of KE-projectiles, rockets or grenades by affecting their impact angle. In order to achieve this, a high pressure wave has to be generated at a certain location close to the threat. With very high blast values it is even possible to damage or destroy these threats.

To reach this goal, the blast wave has to be focused strongly and guided in a predetermined direction as it is known for example with the initiation of nuclear weapons, generation of the spike formed by the shape of a hollow explosive charge or in medical technology by destroying kidney stones etc..

The required high energy density can be generated by explosive charges adapted to the object which is to be protected. For several reasons, it is necessary to keep the explosive mass of the charges small. Therefore, the energy release has to be focused and directed to the point near the threat where it is most effective.

This report presents a first step in the development of such a blast based countermeasure. It shows numerical simulations of different charge geometries (see Figure 1) and different configurations of initiation (number, location and ignition time of initiation points) with regard to improve the performance of the blast wave and the deliberate guidance of the blast direction.

The results show, that it is possible to focus a blast wave with especially defined charge geometries and to enhance the maximum peak pressure/impulse within a certain designated area. A charge with a parabolic shape provided the best results. It is also possible to influence the direction of the blast wave by choosing appropriate ignition points.

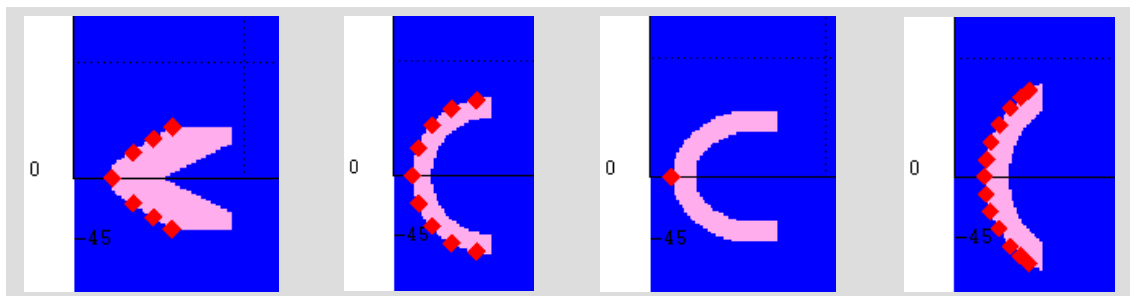


Figure: Models of differently shaped charges with the same charge mass and distributed initiation points