# THEORETICAL CALCULATIONS OF FREE FIELD IRREGULAR MACH REFLECTION PHENOMENA

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Field experiments have been conducted in the past several years with the objective of obtaining better understanding of irregular Mach reflection. The MIGHTY MACH series of 1980 and 1981 provided an impressive data base of overpressure, dynamic pressure, arrival time and shock geometry information as a function of height of burst, ground range and height of target.

Several attempts by various organizations have been made to calculate the detailed flow phenomenology associated with irregular Mach reflection. S-Cubed has recently developed and applied numerical techniques which provide high-resolution descriptions of the blast parameters for free field irregular Mach formation, propagation and dissipation.

A calculation of one of the MIGHTY MACH configurations was made using a refined version of the HULL hydrodynamic computer code with multiple mate-rials. A total of 50**5 zones were used to define the computational mesh. A finely-zoned subgrid of 30’000 zones was placed in the region of Mach reflection to obtain the spatial resolution desired. Special rezone techniques were incorporated to allow movement of the subgrid with the Mach stem inside the computational mesh.

More than 200 points in space were monitored throughout the calculation to provide airblast parameter-versus-time data at actual experimental gage positions. Detailed comparisons of computational results with photographic data and pressure gage signals are presented.