MACH REFLECTION FLOW FIELDS ASSOCIATED WITH STRONG SHOCKS

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The Mach reflection flow field associated with passage of shock wave over a wedge is treated analytically in the limit of an ideal gas and a strong shock (i.e.,Mi>>1, where Mi is the incident shock Mach number). In this limit, flow properties are functions only of wedge angle q and the ratio of specific heats, g. Numerical results are presented for g = 9/7, 7/5 and 5/3. Wedge angles are noted at which transition from regular, to double Mach, to complex Mach, to simple Mach reflection occurs. Characteristic velocities in the recirculation region associated with double and complex Mach reflection are estimated. Local surface pressure maxima, at the upstream and downstream edge of the recirculation region, are also estimated. The scale of the recirculation region increases with decrease in g, in accord with experimental observations. The wedge solution is used on a piecewise quasi-steady basis to estimate height of burst (HOB) flow fields. Normalized results are presented for HOB triple point trajectory and surface pressure variation with range. The present results provide a convenient characterization of Mach reflection flow fields associated with
strong shocks for both wedge and HOB flows.