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Shock interaction behind a pair of cylindrical obstacles HENG LIU, RAOUL MAZUMDAR, VERONICA ELIASSON, Univ of Southern California — The body of work focuses on two-dimensional numerical simulations of shock interaction with a pair of cylindrical obstacles, varying the obstacle separation and incident shock strength. With the shock waves propagating parallel to the center-line between the two cylindrical obstacles, the shock strengths simulated vary from a Mach of 1.4 to a Mach of 2.4, against a wide range of obstacle separation distance to their diameters. These cases are simulated via a software package called Overture, which is used to solve the inviscid Euler equations of gas dynamics on overlapping grids with adaptive mesh refinement. The goal of these cases is to find a so-called "safe" region for obstacle spacing and varying shock Mach numbers, such that the pressure in the "safe" region is reduced downstream of the obstacles. The benefits apply to both building and armor design for the purpose of shock wave mitigation to keep humans and equipment safe. The results obtained from the simulations confirm that the length of the "safe" region and the degree of shock wave attenuation depend on the ratio of obstacle separation distance to obstacle diameter. The influence of various Mach number is also discussed.

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