SHOCK WAVE PROPAGATION IN A BRANCHED DUCT

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The propagation of a planar shock wave in a 90' branched duct is studied experimentally and numerically. lt is shown that the interaction of the transmitted shock wave with the branching segment results in a complex, two-dimensional unsteady flow. Multiple shock wave reflections from the duct's walls cause weakening of transmitted waves and, at late times, an approach to the equilibrium, one-dimensional flow. At most places along the branched duct walls calculated pressures are lower than that existing behind the original incident shock wave. At the branching segment's right comer, where a head-on collision between the transmitted wave and the comer is experienced, pressures are significantly higher than those existing behind the original incident shock wave. The numerically evaluated pressures can be accepted with confidence, due to the very good agreement found between experimental and numerical results with respect to the geometry of the complex wave pattern observed inside the branched duct.