32−19 DYNAMIC RESPONSES OF METALLIC PLATES AND CYLINDERS IMPACTED WITH DETONATION GASES INITIATED USING WIRE EXPLOSION TECHNIQUES

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Dynamic responses of metallic plates and cylinders impacted with planar and cylindrically diverging detonation gases of powder PETN have been investigated respectively, using diagnostic tools and hydro codes for shock propagation and high−strain−rate phenomena. The plane detonation waves initiated by exploding wire−rows generate triangular−shaped pressure pulses in plates, inducing spall or scab fracture, and the cylindrical detonation waves initiated by a wire−explosion at the central axis expand cylinders uniformly and rapidly with the strain rate of above 10^4 s^{-1}. Comparisons of experimental observations and numerical simulations indicate that the developed explosive devices are applicable to study not only detonation−structure interactions but also dynamic behavior of materials.

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