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Interaction between a steady detonation wave in nitromethane and geometrical complex confinement defects. BLANDINE CROUZET, NOEL CARION, PHILIPPE MANCZUR, CEA-DAM Ile de France, BP12, 91680 Bruyeres-le-Chatel — It is well known that detonation propagation is altered if the explosive is encased in an inert confining material. But in practice, explosives are rarely used without confinement and particular attention must be paid to the problem of explosive/confinement interactions. In this work, we have carried out two copper cylinder expansion tests on nitromethane. They differ from the classical cylinder test in that the liner includes evenly-spaced protruding circular defects. The aim is to study how a detonation front propagating in the liquid explosive interacts with the confining material defects. The subsequent motion of the metal, accelerated by the expanding detonation products, is measured using a range of diagnostic techniques: electrical probes, rapid framing camera, glass block associated with streak camera and velocity laser interferometers. The different experimental records have been examined in the light of a simple 2D theoretical shock polar analysis and 2D numerical simulations.

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