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Study of the projectile impact on aluminum targets divided by water TEI SABURI, SHIRO KUBOTA, YUJI OGATA, YUJI WADA, National Institute of Advanced Industrial Science and Technology, TOSHIKAZU NAKANISHI, KOMATSU Ltd. — The impact behavior of a projectile into aluminum alloy targets divided by water was experimentally observed using high-speed video camera, and a numerical simulation was conducted using LS-DYNA. The target size was 5mm in thick, 200mm in height and width. Two target plates were positioned parallel at a distance of 120-180mm, and the space between targets was filled up with water. A SNCM steel projectile was 10mm in height, and 10mm in diameter. The projectile was accelerated by a compact accelerator using an explosive, and impacted on the first target. Impact experiments without water in the gap space were also conducted. In case without water, the projectile penetrated both two targets. On the other hand, in case that water fills up in the gap, The projectile did not penetrate the second target plate, and the both target plates were entirely and largely deformed compared with the case that water is absent. Numerical simulation of the projectile impact was conducted using a finite element code of LS-DYNA. ALE(Arbitrary Lagrangian Eulerian) method was adopted to simulate fluid-structure interaction problem. The deformation behavior of targets was confirmed by the simulation, and the importance of water effect on the deformation of the targets and the de-acceleration of the projectile velocity was shown.

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