35－7 EXPANSION AND FRAGMENTATION OF METAL CYLINDERS DRIVEN BY CYLINDRICALLY EXPLODING DETONATION GAS

知能生産システム工学科　教　授　廣江哲幸
助教授　藤原和人
大学院自然科学研究科　前期課程　永野貴彦
（独）産業技術総合研究所　安部尊之
吉田正典

Cylindrically diverging detonation waves are generated using a wire-explosion technique, and they are applied to expand metallic cylinders (low-carbon steel and 304 stainless steel) axially almost uniformly at very high strain rates of above 10^4 s^{-1}. In this system, a column of high explosive PETN is installed coaxially inside a cylinder specimen and initiated at the central axis by exploding fine copper wires using an impulsive discharge current from a capacitor bank. Hydro codes have simulated the observed behavior of the cylinders, examining the dynamic stress-strain relations and the fracture criteria. Most of the fragments of the exploded cylinders are recovered successfully, and the circumferential fiacture spacing is investigated using sizes of fragments and the Grady' s fragmentation model.

(1st Asian Conference on High Presure Research, Dunhuanhg, China August 20-25, 2002)