

[知能生産システム工学]

33-14 A Study on Spall Fracture Characteristics of Metal Plates Induced by Explosive Shock Loadings

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Spall tests for metal plates are conducted using a testing apparatus developed applying wire-row explosion technique, where one-dimensional triangular-shaped stress waves can be generated in the specimens of Al2024, Al7075 and SUS304 by direct detonation incidence of explosive PETN. A laser interferometry system (VISAR) is adopted to observe the free-surface velocity history of the specimen as an in-situ measurement of spalling failure. The VISAR signals indicate the characteristics of three tested materials and the effects of thicknesses for PETN and the specimen plates, and also reveal two types of damage patterns for Al2024. One and two-dimensional hydro codes are applied to simulate the experimental data numerically, and the comparison recommends the damage accumulation model and the concept of effective thickness for the explosive in practical calculations.

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