

Abstract Submitted
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Metal Wire Explosions in Underwater Discharges DEOK-KYU KIM, SUNG-HYUN BAEK, INHO KIM, Agency for Defense Development — Magnetohydrodynamics of metal wires exploding in underwater electrical discharges have been simulated and the results are compared with the experimental observations by streak camera. We use a one-dimensional time-dependent magnetohydrodynamic simulation code which employs an equation-of-state model and an electrical conductivity model for dense plasmas [1]. The rapidly expanding boundaries of metal plasmas and the resulting shock fronts propagating in the water are computed as function of time for comparison with the streak camera images, which shows fair agreements. In addition, the electrical conductivities of metal plasmas are reproduced from the measured current and voltage profiles and then discussed for verification of the conductivity model used in the simulation.

[1] Deok-Kyu Kim and Inho Kim, Phys. Rev. E **68**, 056410 (2003); Contrib. Plasma Phys. **47**, 173 (2007).

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