Abstract Submitted
for the SHOCK07 Meeting of
The American Physical Society

**Numerical Study of Underwater Explosions and Following Bubble Pulses** ATSUSHI ABE, MASAHIDE KATAYAMA, ITOCHU Techno-Solutions Corporation, Kasumigaseki Bldg., 3-2-5, Kasumigaseki, Chiyoda-ku, Tokyo, 100-6080, JAPAN, KENJI MURATA, YUKIO KATO, Nippon Koki Co.,Ltd., 2-1, Dobu, Nagasaka, Nishigo-mura, Nishishirakawa-gun, Fukushima, 961-8686, JAPAN, KATSUMI TANAKA, National Institute of Advanced Industrial Science and Technology, 1-1-1 Umezono, Tsukuba, Ibaraki, 305-8568, JAPAN — Underwater explosions and following bubble pulses were simulated by using the hydrocode AUTODYN. The pressure gradient depended on the water depth was applied to the water, and the effects of the atmospheric pressure and the gravity on the bubble properties were investigated numerically. In the deep and shallow water depth cases the bubble properties or pressure histories obtained numerically were compared with the empirical formula or the experimental data. Not only the pressure gradient in the water and the atmospheric pressure but also the application of the JWL EOS to slow energy release of the non-ideal explosive (Miller model) were found to be of great importance to simulate the generation of the bubble pulse precisely. Although the gravitational term during the dynamic analysis can be neglected in numerical analyses for very short time phenomena, it is indispensable to simulate the buoyancy of the bubble because the time range of the bubble behavior is some hundred times longer than that of the explosion phenomena.

Atsushi Abe
ITOCHU Techno-Solutions Corporation, Kasumigaseki Bldg.,
3-2-5, Kasumigaseki, Chiyoda-ku, Tokyo, 100-6080, JAPAN

Date submitted: 23 Feb 2007 Electronic form version 1.4