Abstract Submitted
for the SHOCK13 Meeting of
The American Physical Society

**Dynamic Fracture of Borosilicate Glass with Plasma Confinement geometry in Pure Water by Laser-induced Shock Wave** FUMIKAZU SAITO, HIROAKI KISHIMURA, TAKANORI SUZUKI, National Defense Academy — In order to characterize dynamic fracture of borosilicate glass, we performed laser-shock-experiments of both an aluminum-ablator mounted glass and a glass with plasma confinement geometry in pure water by Q-switched $Nd^{3+}$:YAG laser. The incident beam with 440 mJ were focused onto the target approximately 300 $\mu$m in diameter. The dynamic fracture of the glass targets is observed with high-speed digital framing-camera photography. For the aluminum-ablator mounted glass, propagation of the shock wave in water was observed, and the shock-wave velocity is obtained to be 1.65 $\pm$ 0.02 km/s using image processing. Shock-pressure applied the target is estimated to be 180 MPa by Hugoniot relation. For the glass with plasma confinement geometry, generation of the micro-fragments from the rear side of the target was observed. This result indicates that shock-induced fragmentation by laser irradiation is enhanced by the plasma confinement effect. The soft-recovered fragments are separated according the size with PET mesh having deferent mesh size. As a result, the glass with plasma confinement geometry generated smaller fragment than the aluminum-ablator mounted glass.

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Date submitted: 22 Feb 2013 Electronic form version 1.4