Abstract Submitted
for the DPP12 Meeting of
The American Physical Society

Extended Underwater Plasma Generation Using Laser Filamentation[1] T.G. JONES, M.H. HELLE, D. KAGANOVICH, D. GORDON, A. TING, J. PENANO, Plasma Physics Div., Naval Research Laboratory — Techniques to trigger and guide underwater electrical discharges using a laser are currently being developed at NRL. This work may be useful for a variety of applications, including advanced micromachining and low-frequency laser acoustic generation. As part of this development we are studying underwater optical filamentation, which is the extended propagation of a small diameter high-power laser beam, and which typically includes a coincident plasma column. Our group recently made the first demonstration and characterization of ns underwater filaments over 50 cm in length (over 30 Rayleigh lengths). We are also developing a two-laser-pulse ionization and heating scheme to generate an extended underwater plasma and subsequent vapor channel for electrical discharge guiding. Initial extended underwater plasma generation results, as well as results from ongoing underwater laser filamentation experiments and laser plasma characterization experiments, will be presented.

[1]This work is supported by NRL Base Funds.

T. G. Jones
Plasma Physics Div., Naval Research Laboratory

Date submitted: 18 Jul 2012 Electronic form version 1.4