Abstract Submitted
for the DPP05 Meeting of
The American Physical Society

Controlling multiple plasma channels created by a high-power femtosecond laser pulse O.G. KOSAREVA, V.P. KANDIDOV, N.A. PANOV, International Laser Center, Physics Department, M.V. Lomonosov Moscow State University, Moscow, 119992, Russia, Q. LUO, S.A. HOSSEINI, W. LIU, S.L. CHIN, Center for Optics, Photonics and Laser, Department of Physics, Laval University, Qubec, QC, G1K 7P4 Canada — Femtosecond light filaments are comparatively long regions of the spatially and temporally localized radiation zones, which generate free electrons in the medium. At high pulse peak power multiple filaments are produced leading to stochastic plasma channels (Mlejnek et al.: PRL **83**, 2938 (1999)). In both atmospheric long-distance propagation (Sprangle et al., PRE **66**, 046418 (2002), Kasparian et al, Science **301**, 61 (2003)) and focusing the radiation into condensed matter important issues are production of elongated plasma channels, as well as high conversion efficiency to the white light. We control stochastic plasma channels by changing the initial beam size or shape. The result is the increase in the plasma density and white light signal. Control by regular small-scale perturbations allows us to suppress atmospheric turbulence in air and create an array of well-arranged filaments in fused silica.

O. Kosareva

Date submitted: 28 Jul 2005 Electronic form version 1.4