Abstract Submitted
for the DPP07 Meeting of
The American Physical Society

Investigation of X-ray lasers on the SOKOL-P facility at RFNC-VNIITF D.S. GAVRILOV, A.V. ANDRIYASH, D.A. VIKHLYAEV, S.A. GOROKHOV, D.A. DMITROV, A.L. ZAPYSOV, A.G. KAKSHIN, I.A. KAPUSTIN, E.A. LOBODA, V.A. LYKOV, V.YU. POLITOV, A.V. POTAPOV, V.A. PRONIN, G.N. RYKOVANOV, V.N. SUKHANOV, A.S. TISCHENKO, A.A. UGODENKO, O.V. CHEFONOV, RFNC-VNIITF COLLABORATION — The experiments [1] have demonstrated generation of the laser X-radiation (LXR) λ=326A on 3p-3s transitions of Ne-like Ti ions at sequential irradiation of the targets by two laser pulses, focused into a narrow line. The small signal gain equaled 30cm^{-1}. The intensity was $0.5{\cdot}10^{12}$ W/cm^2 in the prepulse of 0.4ns and 10^{14} W/cm^2 in the master pulse of 4ps (delay 1.5 ns). The dependence of LXR yield on the laser energy is demonstrated to have an exponential form. The traveling pumping wave mode was realized using the reflective echelon and the LXR yield is as great as 5-fold. The latest experiments have demonstrated the LXR generation on 4d-4p of Ni-like molybdenum λ=189A. The development of LXR generation model, and numerical codes which allow for the quanta delay effects, quanta refraction in plasma with heavy density gradient, and also the saturation effect have made it possible to describe the experimental dependence of the output LXR yield on the active medium length. Good quantitative agreement is also evident when estimating the output LXR yield on Ne-like Ti ions. [1]Andriyash Quantum Electronics 36 511

D.S. Gavrilov

Date submitted: 04 Sep 2007 Electronic form version 1.4