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**Laser produced nanocavities in dielectrics** LUDOVIC HALLO, CELIA / University Bordeaux 1, ANTOINE BOURGEADE, CEA / CESTA, CANDICE MEZEL, CELIA / University Bordeaux 1, VLADIMIR TIKHONCHUK, CELIA University Bordeaux 1, EUGENE GAMALY, ANU — Tight focusing of the laser pulses opens a possibility to modify the properties of transparent materials and create high-density memories and photonic crystals. It was demonstrated recently [1,2] a formation of sub-wavelength holes by focusing a 100 ns, 100 fs laser pulses inside samples of saphir and glass. This paper presents the results of numerical simulations of the interaction of sub-ps laser pulses with transparent dielectrics. It contains two parts : a 2D model of the laser energy deposition, based on the solution of full Maxwell equations coupled to a ionisation model accounting for the multiphotonic and avalanche ionisation, and the 3-body recombination. The second part presents the 2D hydrodynamic simulations of the shock wave propagation and the cavity formation with initial conditions provided by 2D absorption model. It is shown that the cavity parameters are very sensitive to the properties of the EOS in the phase transition domain.

[1] E.G. Gamaly, S. Juodkazis, K. Nishimura, H. Misawa, B. Luther-Davies, L. Hallo, Ph. Nicolai, V. T. Tikhonchuk, Phys. Rev. B 73, 214101 (2006). [2] S. Juodkazis, K. Nishimura, S. Tanaka, H. Misawa, E.G. Gamaly, B. Luther-Davies, L. Hallo, Ph. Nicolai, V. T. Tikhonchuk, Phys. Rev. Lett. 96, 166101 (2006).

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