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Investigation of instability of the shell distribution produced in the process of interaction of whistler waves with a magnetized plasma¹ V.B. KRASOVITSKIY², V.I. SOTNIKOV, Y. SENTOKU, University of Nevada at Reno, NV 89557, USA, J.N. LEBOEUF, JNL Scientific, Casa Grande, AZ 85222, USA — A theoretical model of cyclotron interaction of electrons with whistler waves excited in the process of laser pulse propagation in a magnetized plasma, connected with the pitch-angle diffusion of electrons, leads to formation of the shell-like distribution of resonant electrons [1]. This distribution formed due to quasi-linear diffusion of resonant electrons in the presence of whistler waves, produced in the process of propagation of a laser pulse along the external magnetic field, can be responsible for the excitation of electrostatic waves propagating at an angle to the magnetic field. These waves can then cause heating of the cold electrons in the system. In order to better understand the heating mechanisms associated with the instability of the shell distribution, we performed 2D PIC simulations. These provided an estimate of the amount of energy transferred from the laser pulse to the cold plasma particles. [1] V. I. Sotnikov, Y. Sentoku, V.B. Krasovitskiy, Physics of Plasmas, 12, 1 (2005).

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