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**Results of magnetoactive laser produced plasma investigations.** VADIM BELYAEV, CRIMB RFSA — Lifetime of the magnetic field generated in laser plasma is demonstrated to far exceed the laser-producing pulse duration. The theory of the pinch effect in laser plasma gains its development. The increase in density and temperature at pinching, as well as the long life of the magnetic field confining the hot plasma, are demonstrated to provide a possibility for the Lowson criterion of Break-even thermonuclear reaction to be realized in laser plasma. Here we offer our explanation of the dependence of the neutron yield from D-D fusion reactions on the laser radiation intensity and energy for the pico- and femtosecond laser pulse. With our laser plant, up to $2\times10^{18}$ W/cm$^2$ intensity, we investigated the D-D fusion reaction neutron yield (up to $10^6$ per a pulse). We also implemented p + $^{11}$B $\rightarrow 3\alpha$ + 8.7 MeV reaction to investigate the $\alpha$-particle yield (up to $10^3$ per a pulse) and spectral response. Further, we measured the plasma ion energy (temperature) distribution and noted the presence of a small group within the energy range of $\sim$ 1 MeV. We also noted a high-energy ion stream directed inward the target and here we suggest the mechanism of the movement of the sort. When investigating $\gamma+^9$Be $\rightarrow 2\alpha$ + n reaction, we registered neutron yield of $\sim 3 \div 7$ per a pulse, estimated the share of the electrons and $\gamma$-quanta which occur in laser plasma with the energy of $\geq$ 2 MeV and are responsible for the implementation of this reaction.

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