EVOLUTION OF ELECTRON TEMPERATURE OF GAS TARGET IRRADIATED WITH 527NM LASER PULSE IN THE PRESENCE OF A MAGNETIC FIELD

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Magnetic field has profound influence on the energy transport in plasmas [1]. Recent experiments show promising aspect of magnetic fields in inertial confinement fusion[2,3]. In this presentation, we report our experiments on the temperature evolution of a plasma generated by irradiating a gas target with a 527nm laser pulse in the presence of 7-Tesla-magnetic field. The plasma parameters are inferred from Thomson scattering signals. The energy of the laser pulse is only several joules in our experiment. In comparison with the data without the presence of magnetic field, the temperature of the heated plasma could be doubled due to the inhibited electron thermal flux in the presence of the magnetic field. Our analysis indicates that the dissipation of the magnetic field may also play role in the evolution of the electron temperature.

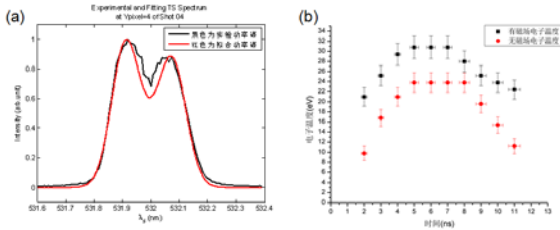

Figure 1 (a) A fitting of Thomson scattering spectrum, and (b) the evolution of electron temperature with and without magnetic field.

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[2] P. Y. Chang, et al., Phys. Rev. Lett. 107, 035006 (2011).
[3] M. R. Gomez, et al., Phys. Rev. Lett. 113, 155003 (2014).