Characterization the state of laser-produced Au plasmas by measuring the X-ray emission spectra of buried Ti trace

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Au plasma states were characterized by measuring x-ray emission spectra from the the buried Ti layer gold planar target irradiated by nanosecond laser pulses on the Shenguang-III laser facility [1]. The time-resolved x-ray emission spectra of hot titanium plasmas were measured by a streaked crystal spectrometer. The measured data were reproduced by the FLYCHK code [2], and the temperature and density of plasmas were deduced from the simulated spectra. In order to evaluate the feasibility of the method of the x-ray emission spectra of buried Ti trace layer, laser-produce Au plasmas were simulated with the multi-1D [3] hydrodynamic simulations. Due to the simulations do not take the radial gradients into account, some deviations between the experimental and simulation results have been found. In this talk, the details of the experiment and theoretical work will be presented.

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