PRESENT STATUS OF COUNTER IRRADIATING DIRECT FAST HEATING SCHEME BY USING HAMA

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A concept behind fast heating scheme is to pre-compress a cold fuel and subsequently to ignite it by using a short pulse high-intense laser [1]. The critical issue for fast heating is the transport of energy from heating laser to the imploded core. In the previous integrated fast heating experiments, such as GEKKO PW, LFEX, and OMEGA EP, they irradiate a heating laser pulse from one-direction into the imploded core by using cone-in-shell target. In contrast, in Hamamatsu, by using a counter irradiating laser system installed in HAMA [2], we have irradiated 110 fs, 7 TW heating pulses direct to a imploded plasma core induced from a spherical shell target with diameter of 500 μm, and thickness of 7 μm as shown in Fig. 1. Here, we can deposit energy of sort pulse lasers into the core central as shown in Fig. 2. The heating region was 60 μm in central. This result seems to indicate some alternative heating mechanism based on counter irradiating scheme [3] or direct fast heating scheme [4].

In this presentation, we show the present status of counter irradiating direct fast heating experiments and its evaluation by using a fast heating simulator that include both hot-electron and fast ion contribution [5-7].

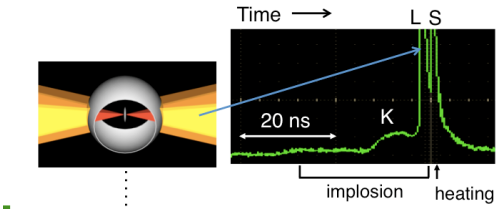

Figure 1: A schematics of experiments by using laser HAMA [2].

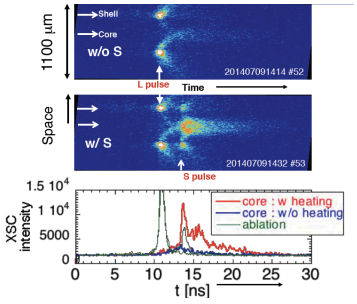

Figure 2: X-ray photo emission profile for w heating and w/o heating pulse.

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