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Simulations for plasma heating of the core plasma in fast ignition ATSUNORI OKABAYASHI, HIDEAKI HABARA, KAZUO A. TANAKA, Osaka University, AMITA DAS, Institute of Plasma Physics, India, G. RAVINDRA KUMAR, Tata Institute of Foundermental Research, India, PREDHIMAN KAW, Institute of Plasma Physics, TOSHINORI YABUUCHI, UC, San Diego, SUDIP S. GUPTA, Institute of Plasma Physics, India — Heating of core plasma by fast electrons is a backmost and utmost issue in fast ignition. Although several efforts in simulation to understand the heating mechanism and consequently the deposit energy in the core, it has been unknown due to complicated physical processes and insufficient computer resource for a full-scale simulation. For this situation, we separate collisional and collective processes by using different type of simulations. In order to simulate collisional energy deposition, we performed a Monte-Carlo code, EGS5, to estimate the core temperature by using the previous integrated experiment as the calculation condition [1]. In the results, the temperature increases from the low dense to the core where the maximum temperature is obtained up to several tens eV, which is near the half of the temperature in the experiment In addition, we found the electrons around 1 MeV mostly contribute to the heating. On the other hand, we observe the significant reduction of electrons up to 10 MeV possibly by depositing their energies on the core in the above experiment and indicate a new collective energy deposition mechanism in EMHD framework [2]. We're developing a new code to verify the EMHD approach. [1] R. Kodama et al., Nature 412, 23 (2001). [2] T. Yabuuchi et al., submitted to New J. Phys. (2009).

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