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Diffusion of external magnetic fields into the cone-in-shell target in the fast ignition ATSUSHI SUNAHARA, CMUXE, Purdue University, HIROKI MORITA, Institute of Laser Engineering, Osaka University, TOMOYUKI JOHZAKI, Hiroshima University, HIDEO NAGATOMO, SHINSUKE FUJIOKA, Institute of Laser Engineering, Osaka University, AHMED HASSANEIN, CMUXE, Purdue University, FIREX PROJECT TEAM — We simulated the diffusion of externally applied magnetic fields into cone-in-shell target in the fast ignition. Recently, in the fast ignition scheme, the externally magnetic fields up to kilo-Tesla is used to guide fast electrons to the high-dense imploded core. In order to study the profile of the magnetic field, we have developed 2D cylindrical Maxwell equation solver with Ohm's law, and carried out simulations of diffusion of externally applied magnetic fields into a cone-in-shell target. We estimated the conductivity of the cone and shell target based on the assumption of Saha-ionization equilibrium. Also, we calculated the temporal evolution of the target temperature heated by the eddy current driven by temporal variation of magnetic fields, based on the accurate equation of state. Both, the diffusion of magnetic field and the increase of target temperature interact with each other. We present our results of temporal evolution of the magnetic field and its diffusion into the cone and shell target.

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