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Numerical analysis of Melting Phenomenon on plates drving by large pulse current GANGHUA WANG, MINGXIAN KAN, Institute of Fluid Physics, CAEP, COMPUTATIONAL PHYSICS TEAM — Characteristic properties of materials under high pressure, such as isentropic compression lines, are very important, which can be investigated through pulsed intense magnetic field and magnetic force generated by large-current facilities. However, due to the strong Ohmic heating caused by the intense current flowing through the loads, the load material undergoes a series of phase transitions including melting, vaporization and even ionization into plasmas. Therefore, estimation and prediction of the ablation condition of the loading surface play an extremely important role in load design and fulfillment of physical goals of large facilities. In this work, the melting of an aluminum plate under a 30 MA loading current is investigated using the MDSC2 code, which is based on Burgess' resistivity model and Linderman's melting criteria. For aluminum plates of different thicknesses, temporal variation of the ablation layer as well as typical physical quantities (i.e. density, temperature, pressure, etc.) during the late time at the interface between the ablation and non-ablation regions are obtained.

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