

TWO-DIMENSIONAL SIMULATIONS OF STRONGLY RADIATING PLASMAS WITH THE RALEF-2D CODE

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Results of the first series of simulations of the dynamics of strongly radiating plasmas with the RALEF-2D code are presented. The RALEF-2D code has been developed in collaboration with the GSI (Darmstadt) and Frankfurt University (Frankfurt). It solves the equations of two-dimensional hydrodynamics on adaptive arbitrary Lagrangian-Eulerian meshes together with the equation of multigroup (in frequency and angles) radiation transport. As two illustrative examples, (1) the process of hole boring in a copper foil by an intense nanosecond laser pulse, and (2) the problem of radiative collapse of a tungsten plasma cloud created in multi-wire Z-pinches [experiments on the Angara-5 (Troitsk) and Z (Sandia) facilities] have been simulated. It is shown that under the conditions of ideal symmetry the radiative collapse leads to the formation of a strongly coupled plasma core characterized by the coupling parameter $\Gamma \approx 10$ with respect to the ion-ion interaction.