Contribution ID: **34** Type: **Poster**

OVERHEATING INSTABILITY OF A THIN CONDUCTOR WITH RESPECT TO STRATIFICATION

Tuesday, 20 June 2017 13:30 (1h 30m)

We consider an overheating instability of a thin (compared to the skin depth) conductor with respect to stratification at the stage when its resistivity rises up to an electrical explosion. Temperature perturbations under such conditions are shown to grow in proportion to resistivity. In the model, when resistivity is proportional to temperature, perturbations grow in proportion to temperature and hence exhibit no relative growth. For a conductor with initial thickness perturbations, temperature perturbations grow in proportion to resistivity and current action integral, i.e., somewhat faster than perturbations in the problem of constant thickness conductor. Comparison of our results with simulations of the growth of stratification during electrical explosion of foils in warm dense matter systems [1, 2] demonstrates their close agreement.

1. S. F. Garanin, S. D. Kuznetsov, R. E. Reinovsky, "Feasibility of Warm Dense Matter generation using aluminum and copper foil electrical explosion under the PHELIX facility current drive,"J. Appl. Mech. Tech. Phys., V. 56, No. 1, pp. 10-15, 2015.
2. S. F. Garanin, S. D. Kuznetsov, and R. E. Reinovsky, "Study of the feasibility of Warm Dense Matter generation using metal foil electrical explosion under megaampere current drive,"Digest of Technical Papers, 20-th IEEE Int. Pulsed Power Conf., Austin, TX, USA, 2015, pp. 622-627.

Primary authors: GARANIN, Sergey (Russian Federal Nuclear Center - VNIIEF); Dr KUZNETSOV, Sergey (Russian Federal Nuclear Center - VNIIEF)

Presenter: GARANIN, Sergey (Russian Federal Nuclear Center - VNIIEF)

Session Classification: Poster session II - High-Energy Density Physics and Technology

Track Classification: High-Energy Density Physics and Technology