New Approach to Metal–Insulator Phase Transition Kinetics in Magnetic Field.

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The metal–insulator phase transition is considered on the basis of Ginzburg-Landau type equations with two different order parameters. An inclusion of magnetic field in this picture is an important step for understanding of behavior of the metal–insulator phase transition kinetics. The magnetic field leads to various singularities of the surface tension and results in drastic variations of the phase transition kinetics. The strongest singularity is due to Landau diamagnetism and determines anomalous features of MI transition kinetics. This singularity supports the well known experimental fact that almost all semimetals behave like diamagnetic materials [1].

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Biographie.

Born 1945. Post-graduate student of Moscow State University (1968-71). Candidate of Physical Sciences from Moscow State University (1971). Leading Researcher of Theoretical Div., Dept. Superconductivity and Solid State Physics (Kurchatov Institute). Associated Prof. from Moscow Inst. of Physics and Technology. Number of Publications: 78. Fields of interest: Low Temperature Physics and Phase Transitions.

List of recent publications:

1. "Quantum Spinodal Decay of a Metastable Liquid at Low Temperatures" J.Low Temp. Phys., 138, 2005 (with S.N. Burmistrov and Y. Okuda)

2. "Kelvin-Helmoltz Instability and Dissipation in a Phase Separated He3-He4 Liquid Mixture" J.Low Temp. Phys., 138, 2005 (with S.N. Burmistrov and T. Satoh)

3. "Underbarrier nucleation kinetics in a metastable quantum liquid near the liquid-gas spinodal line" Phys. Rev. B 71 p. 054512, 2005 (with S.N. Burmistrov and Y. Okuda)

4. "Quantum Fingering of the Inverted Liquid Crystal He4 Interface in the Field of Gravity" J.Low Temp.Phys., 146, Nos.5/6, 2008 (with S.N. Burmistrov)

5.Hydrodynamic instability during non-uniform growth of a helium crystal- Journal of Physics: Conference Series, 209, 032013, 2009
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6. Rayleigh-Taylor instability of crystallization waves at the superfluid-solid 4He - Physical Review E, v.79, No.5, p.051606, 2009
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7.Instability of a crystal He4 facet in the field of gravity, Journal of Low Temperature Physics, 162, 5/6 383-390, 2011
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8.Hydrodynamic Instability During Non-uniform Growth of a Helium Crystal, Journal of Low Temperature Physics, 162, 5/6 391-398, 2011
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9. "Features of the surface tension for the metal – insulator boundary in the vicinity of MI phase transition in the presence of external magnetic field", JETP Letters **99**, No. 1, pp. 22-26 (2014)

10. "Quantum Magnetic Oscillations of the Surface Tension at the MI Interface" J. Low Temp. Phys. **182**, 192-205 (2016).

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