

Abstract Submitted
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Fluctuoscopia of Disordered Two-Dimensional Superconductors¹

ANDREAS GLATZ, Argonne National Laboratory, ANDREY VARLAMOV, University of Rome, Tor Vergata, VALERII VINOKUR, Argonne National Laboratory — In this talk I will present our results for the fluctuation conductivity (FC) in disordered two-dimensional superconductors placed in a perpendicular magnetic field. In our works [1,2] we finally derived the complete solution in the temperature-magnetic field phase diagram. The obtained expressions allow both to perform straightforward (numerical) calculation of the FC surface $\delta\sigma(T, H)$ and to get all 27 asymptotic expressions in the seven qualitatively different domains of the phase diagram. This surface becomes in particular non-trivial at low temperatures, where it is trough-shaped and close to the quantum phase transition non-monotonic, in agreement with experimental findings. I will show our main results and demonstrate how these can be used as a high precision tool (fluctuoscope) to determine the critical temperature, critical magnetic field, and dephasing time from experimental data in superconducting films.

[1] A. Glatz, A. A. Varlamov, and V. M. Vinokur, EuroPhys. Lett. **94**, 47005 (2011).

[2] A. Glatz, A. A. Varlamov, and V. M. Vinokur, Phys. Rev. B **84**, 104510 (2011).

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