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Pseudogap and zero-bias anomaly due to fluctuation suppression of quasiparticle tunneling¹ ANDREAS GLATZ, Argonne National Laboratory and Northern Illinois University, ANDREY VARLAMOV, CNR-SPIN, University of Rome, Italy, VALERII VINOKUR, Argonne National Laboratory — In this talk, I will present our study of the effect of superconducting fluctuations on the tunnel current-voltage characteristics of disordered superconducting films placed in a perpendicular magnetic field in the whole field-temperature phase diagram outside the superconducting region. This tunnel-current is experimentally accessible by STM measurements and therefore directly relevant for the interpretation of experimental results, in particular the pseudogap state. We derived a complete expression for the tunneling current (and the tunneling conductance) for arbitrary fields and temperatures and discovered an important nonlinear contribution, which appears due to dynamic fluctuation modes and results in the formation of a strong zero-bias anomaly on the scale at small voltages. At large voltages, fluctuations form a pseudogap maximum.

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