P-FKP27: Excess Hall conductivity of layered superconductors in strong electric fields

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The fluctuation Hall conductivity of a layered superconductor in an arbitrarily strong in-plane electric field and a perpendicular magnetic field is computed in the frame of the Langevin approach for the time-dependent Ginzburg-Landau equation. The fluctuation interaction is also taken into account in the self-consistent Hartree approximation. For high-temperature superconductors in moderate magnetic fields and electric fields of the order of 100 V/cm we predict a pronounced non-Ohmic behavior and a relative suppression of the excess Hall conductivity stronger than for the longitudinal one. For weak electric fields, our result is found to reduce to previous results of the linear response approximation.

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