Anisotropic Quantum Hall Droplets

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Abstract

This talk is devoted to recent developments on two-dimensional droplets of free electrons in a strong magnetic field, confined by generally anisotropic electrostatic potentials. Having developed a semiclassical expansion scheme to obtain approximate Gaussian eigenstates of the one-body Hamiltonian, I apply it to "edge-deformed" potentials of particular interest. I then explain how these one-particle insights can be extended to full many-body droplets, showing for instance how their density differs from naive guesses extrapolated from the literature. Finally, I compute the ground state correlation function near the droplet's boundary and derive the corresponding low-energy effective field theory. The latter is a homogeneous chiral conformal field theory of edge modes, despite the fact that their lab velocity is position-dependent along the boundary. (Based on arXiv:2301.01726)

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