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Vanishing Fredholm Determinants, Quantized Traces, and Algebraic K-theory

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Using ideas from algebraic K-theory, we prove that a simple and physically naturally criterion of Kitaev trivializes the Fredholm determinant of a multiplicative commutator. This is directly related to the quantized Kubo trace formula in the 2D quantum Hall effect. Then we will explain how rationally quantized traces arise from Carey-Pincus theory. Furthermore, we will present new robust quantized trace formulae in any dimension, whose existence also relies on algebraic K-theory arguments. Joint work with Ludewig, Xia, and Tang.