



MAFIA - the seminar you can't refuse

Formulas of Szegő type for the periodic Schrödinger operator

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Abstract: Szegő's limit theorem describes the asymptotic behaviour of Toeplitz determinants as the size of the Toeplitz matrix grows. The continuous analogue are trace asymptotics for Wiener-Hopf operators on intervals of growing length. These asymptotics are of particular interest when the symbol of the Wiener-Hopf operator has jump discontinuities: they can be used to compute the bipartite entanglement entropy of a free Fermi gas in its ground state. We look at the case that the corresponding one-particle Hamiltonian is a periodic Schrödinger operator (rather than the unperturbed Laplacian). In this context, we present a two-term asymptotic trace formula for the periodic Schrödinger operator in dimension 1. The subleading order of the asymptotics identifies the spectrum of the periodic Schrödinger operator. This is joint work with Alexander V. Sobolev.