

On the abstract Landauer-Büttiker formula and applications

H. Neidhardt

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The Landauer-Büttiker formula is an important tool to calculate the current in quantum systems. To give a rigorous proof in an operator-theoretical framework is therefore very important. The talk presents such a proof where in contrast to existing ones the formula is verified for non-semibounded self-adjoint operators. The result is obtained by verifying a Landauer-Büttiker formula for unitary operators. Using the Cayley transform one gets a proof for self-adjoint operators. The result is applied to non-semibounded self-adjoint operators like Dirac operators on the real line and for dissipative Schrödinger operators on bounded intervals.

The talk is based on a common paper with Horia Cornean (Aalborg, Denmark), Lukas Wilhelm (WIAS, Berlin) and Valentin Zagrebnov (Marseille, France).