

SEMINÁŘ OTF ÚJF, ŘEŽ

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**The Aharonov-Bohm effect  
for the heat flow**

**Abstrakt**

We study the influence of a compactly supported magnetic field on spectral-threshold properties of the Schroedinger operator and the large-time behaviour of the associated heat semigroup. We derive new magnetic Hardy inequalities in any space dimension  $d$  and develop the method of self-similar variables and weighted Sobolev spaces for the heat equation.

A careful analysis of the heat equation in the self-similar variables shows that the magnetic field asymptotically degenerates to a singular Aharonov-Bohm magnetic field, which in turn determines the large-time behaviour of the solutions in the physical variables. We deduce that in  $d=2$  there is an improvement of the decay rate of the heat semigroup by a polynomial factor with power proportional to the distance of the total magnetic flux to the discrete set of flux quanta, while there is no extra polynomial decay rate in higher dimensions.

**Seminář se koná v pátek 20. 2. 2015 v 10:30 hod.**

**v seminární místnosti OTF ÚJF Řež**

A. Ciepły/otf