Scientific Modelling Computer Lab Cover Letter

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Dr. Pollner Péter

Eötvös Lóránd University

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Dear Dr. Pollner:

I am pleased to submit my report entitled “Numerical simulation of quantum transport phenomena” as homework assignment for the course “Scientific Modelling Computer Lab”. I investigated several types of quantum transport phenomena using a numerical simulation package.

In this report, I present my recent achievements in numerical simulation of quantum transport phenomena. These include a simple quantum point contact, a quantum point contact placed in magnetic field, and a graphene lattice.

In my work, I used *kwant* a python package designed to simulate quantum transport phenomena within the tight-binding model. In this report I cover the theoretical background of my work, as well as the results achieved so far.

All the code I have written is available at the github page of the course. As a further work, I plan to study the behavior of topological Anderson insulators using the kwant software.

Thank you for your help and motivation!

Best regards,

Dániel Nagy