

# Hall and Shubnikov de Haas Quantum Transport

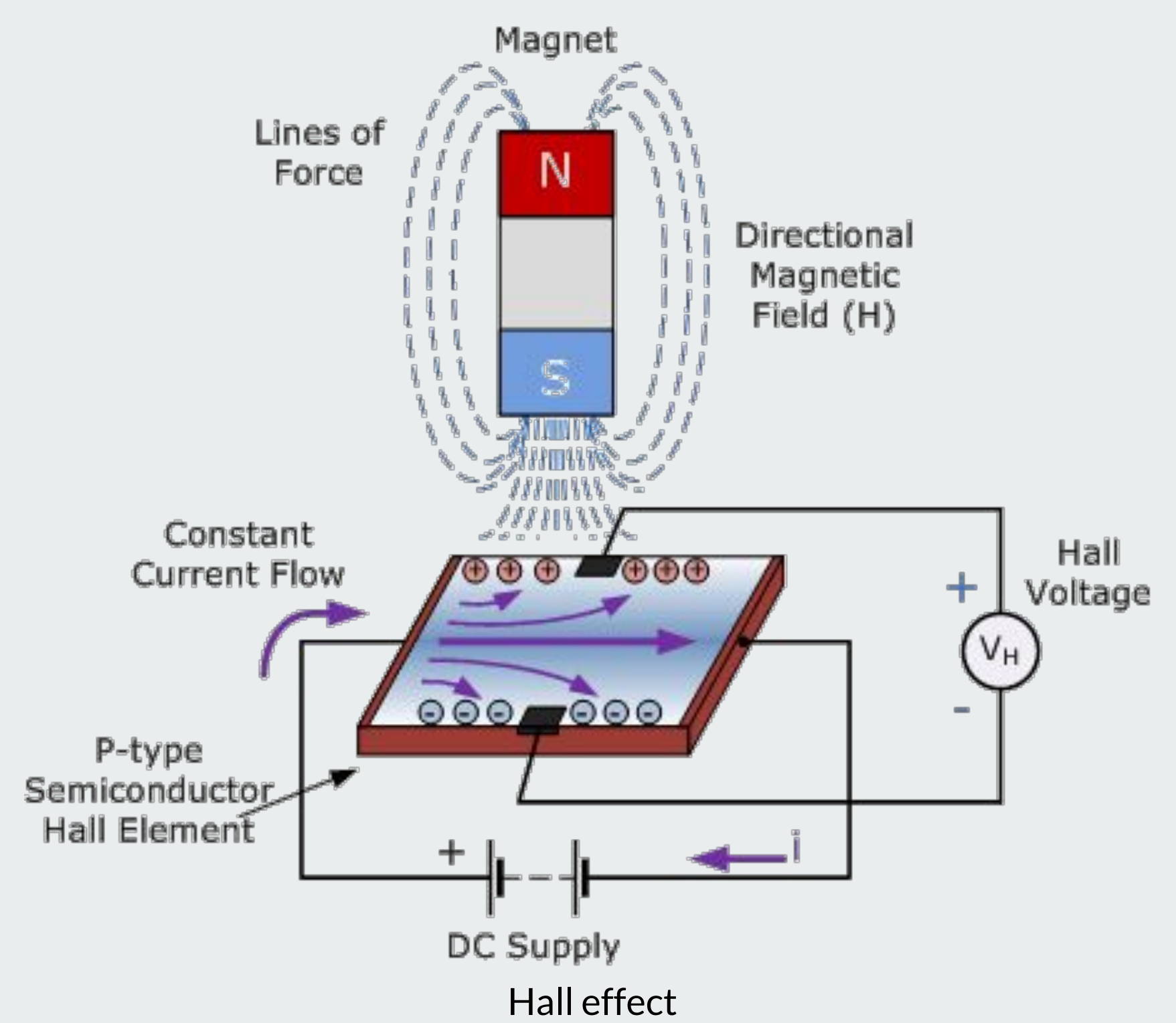
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## Quantum Hall effect

This is a quantized version of Hall effect in two dimensional system at low temperature and high magnetic field. Hall effect is the production of a voltage difference across a conductor, transverse to the current in the conductor and to an applied magnetic field perpendicular to the current. In Quantum Hall effect, the hall resistance exhibits steps that takes quantized values at certain level.

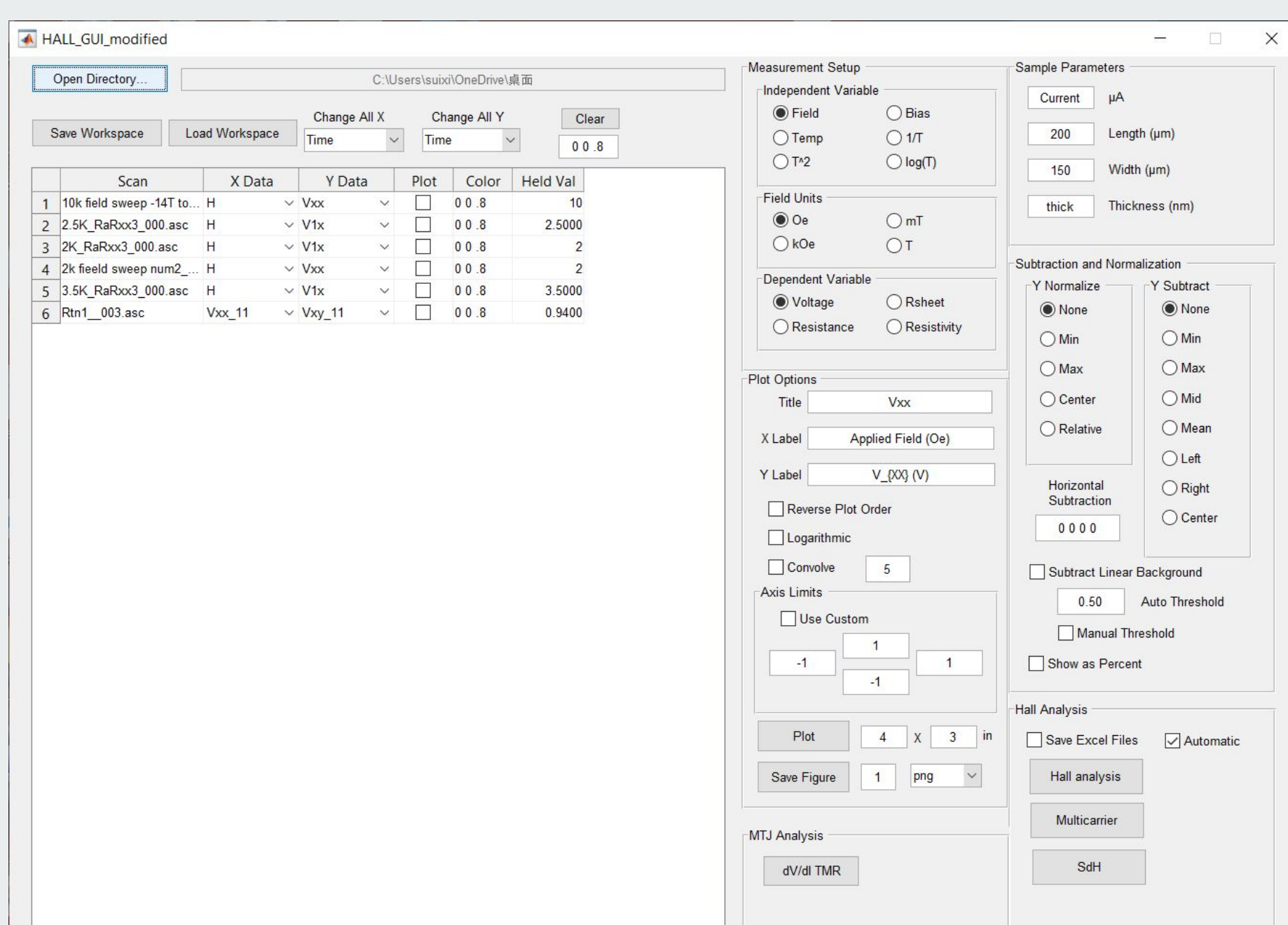


## Shubnikov–de Haas effect

The Shubnikov-de Haas effect is that an oscillation of conductivity occurs at low temperature and in the presence of intense magnetic field. This effect can be used to determine the charge carriers' properties.

These effect can help determine parameters of materials. We can put a semiconductor under certain temperature and magnetic field, collect data on voltage, and thus can get properties like carrier density and mobility of the material.

In the project, I helped develop a software for automation of measurements. The software will take in the data and automatically process it as the user command, which provide convenience for processing the data.



Software I worked on.

## Result

The software includes models of multicarrier system for isotropic and anisotropic materials. It can also do LK fit for Shubnikov de Haas effect. The software has been tested on a small scale of data and works well. It's still under development for now.

## Acknowledgements

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