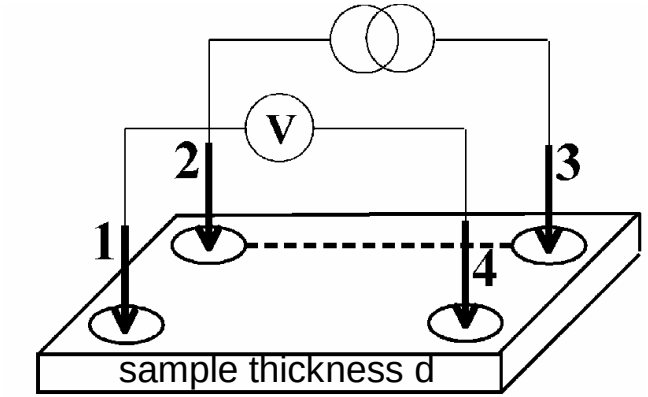
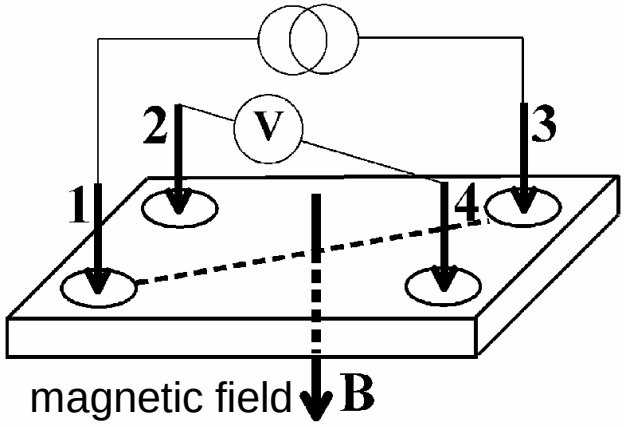
Sheet resistance & Hall effect measurement in Van-der-Pauw geometry

Current and voltage measurements without and with magnetic field B





Sheet resistance

Hall constant

$R_S = [\pi/\ln(2)]\ U_{14}/I_{23} = 1/(q\ \mu\ n\ d)$

$R_H = (U_{24}\ d)/(I_{13}\ B) = 1/(q\ n)$

➔ Concentration n and mobility μ of charge carriers *(q: elementary charge)*

Available Hall- effect measurement systems

Selfmade system

- Electromagnet with B=0.8 T
- Sample temperatures 100 – **800 K**
- Resistance range $1x10^{-1}$ - $1x10^{9}$ Ω

Lakeshore HMS 9709 A

- Superconductive magnet with B= **9 T**
- Sample temperatures **2** – 400 K
- Resistance range **$5x10^{-5}$ - $2x10^{11}$ Ω**