Introduction

Outline
- Purpose of the experiment (1/2)
  - It is possible to measure some characteristics of crystals.
    - the resistivity of a crystal (germanium) as a function of temperature.
    - Hall voltage (potential diff when the charges in a B field separate) as a function of temperature.
    - How the intensity of the magnetic field affects the resistance of the crystal.
- Theory (1 + 1/2)
  - Conduction in a semi-conductor
  - The resistivity
    - The theory (1/2)
    - Sample place is connected to :
      - Power supply that is used to power the heater that will increase the temperature of the sample.
      - Current source that supply a constant current of 1mA to the crystal allowing to measure a voltage.
      - Thermocouple that measure the temperature of the crystal
      - Digital multimiter (DMM) that reads the eight different voltages that are of interest for the experiment (they are described in Figure …). It also reads the value of the temperature and the current through the sample. The value can be seen on the computer or displayed on the DMM apparatus.
    - The sample is cooled down with liquid nidrogen to approximetaly 150K and temperature increase naturally to room temperature until 295K and then DC power supply used to heat it up more to a final temperature around 383K

  - The hall effect (1/2)
    - Theory
    - The sample is placed between two magnets. The magnets

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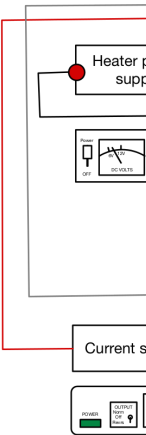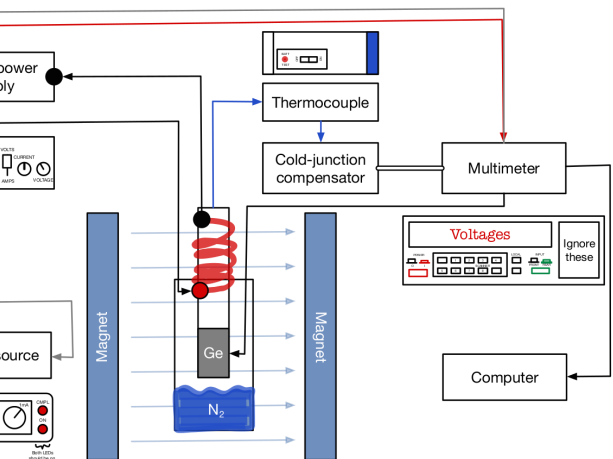
- The hall effect (1/2)
  - Theory
  - The sample is placed between two magnets. The magnets are supplied current with the DC power supply and a Hall probe (Gaussmeter) is used to measure the strength of the magnetic field in tesla (T). The temperature variation is done in a similar fashion to the resistivity measurements

- Result (if not enough page skip that and include in the abstract maybe)