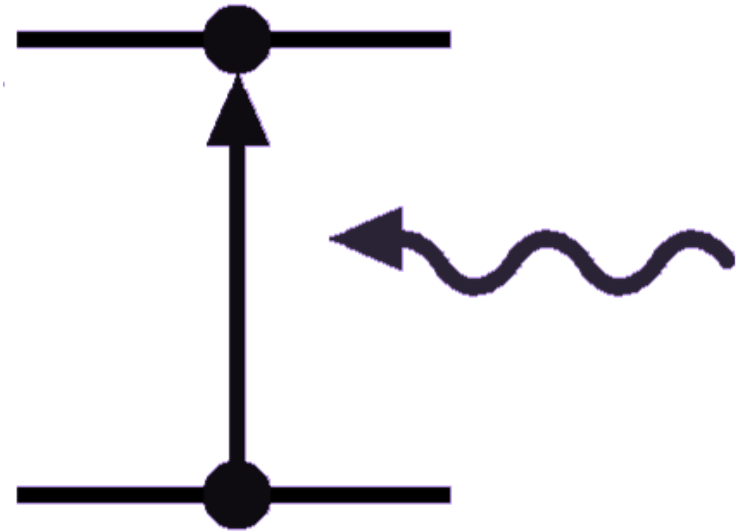
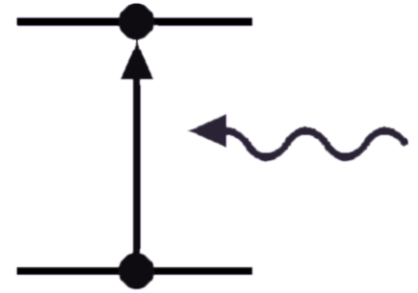


A Table Top Demonstration of General Relativity Using the Mössbauer Effect

Emily Morrow, August Gula, Mark Yuly
Physics Department
Houghton College



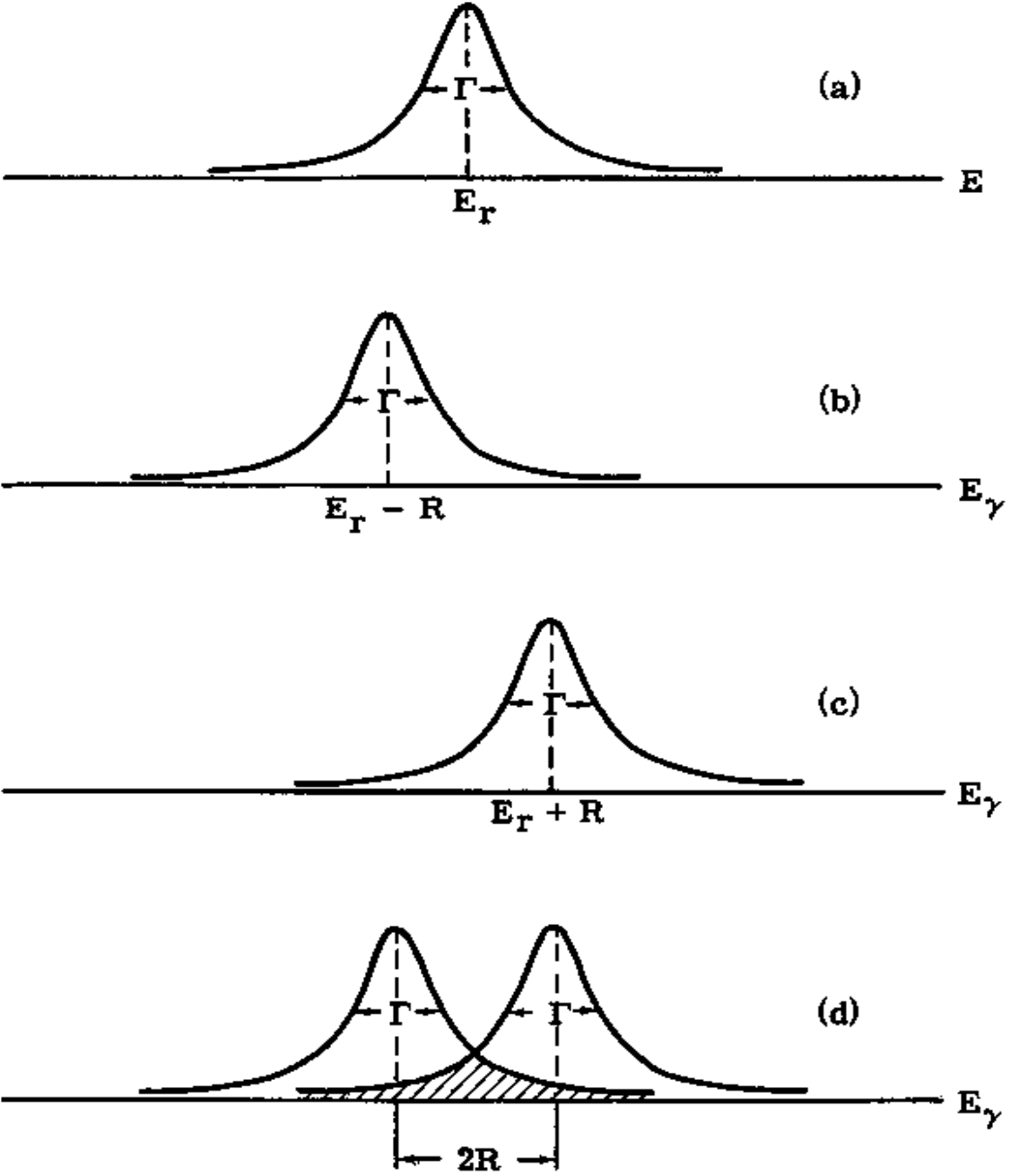
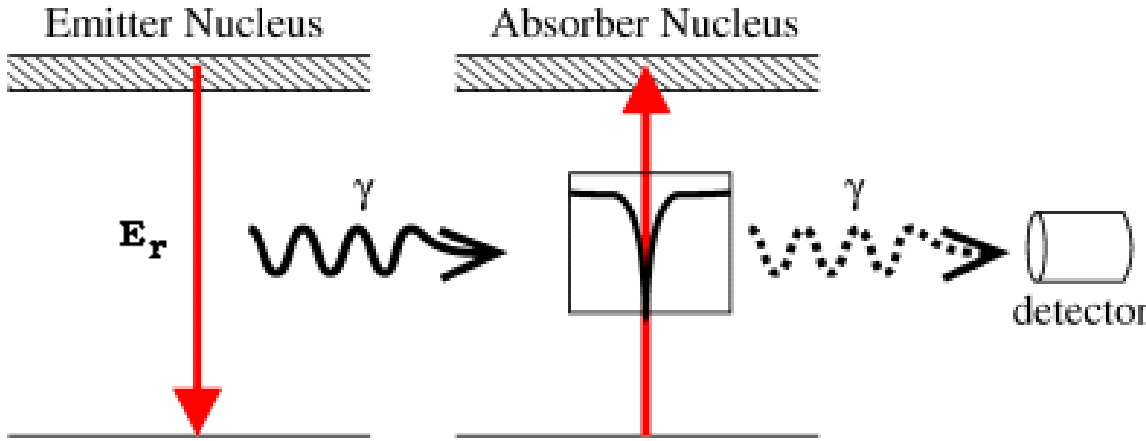
Motivation



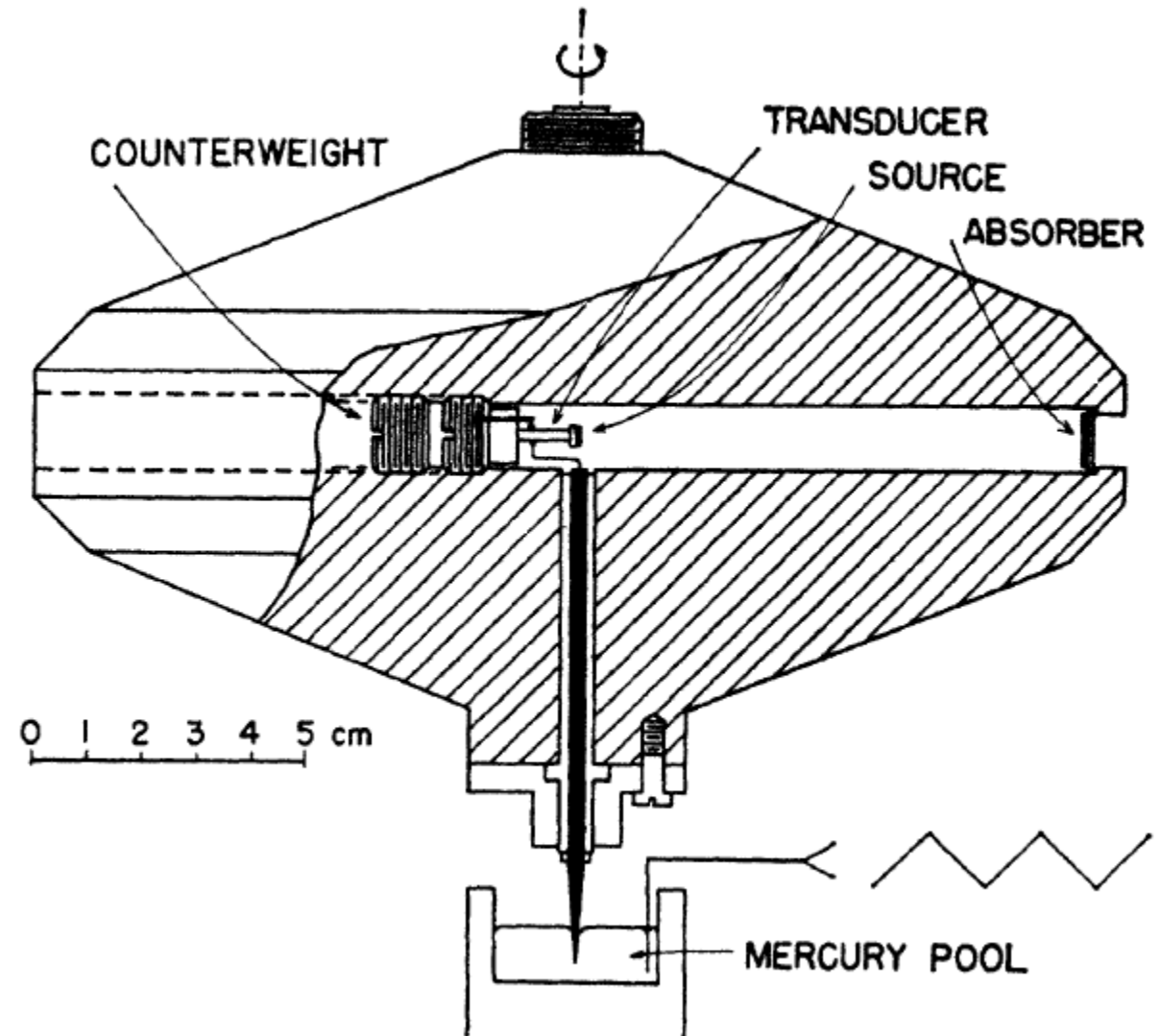
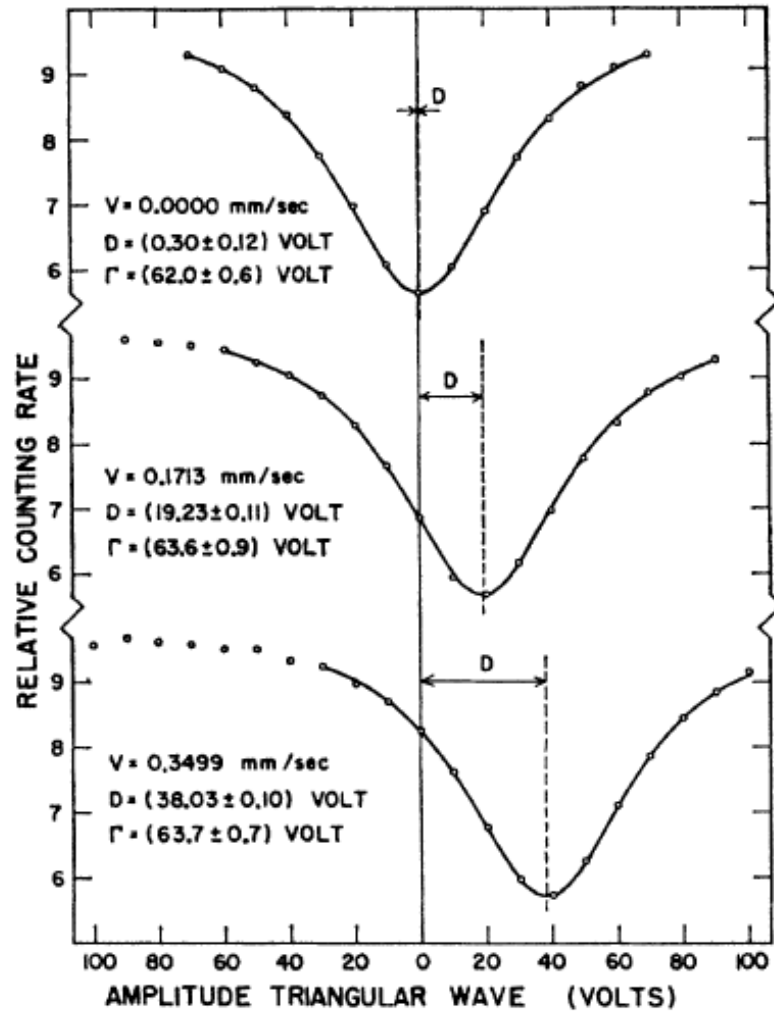
Demonstrate General Relativity using:

- the Mössbauer effect
- a small radioactive source
- coincidence measurements

The Mössbauer Effect

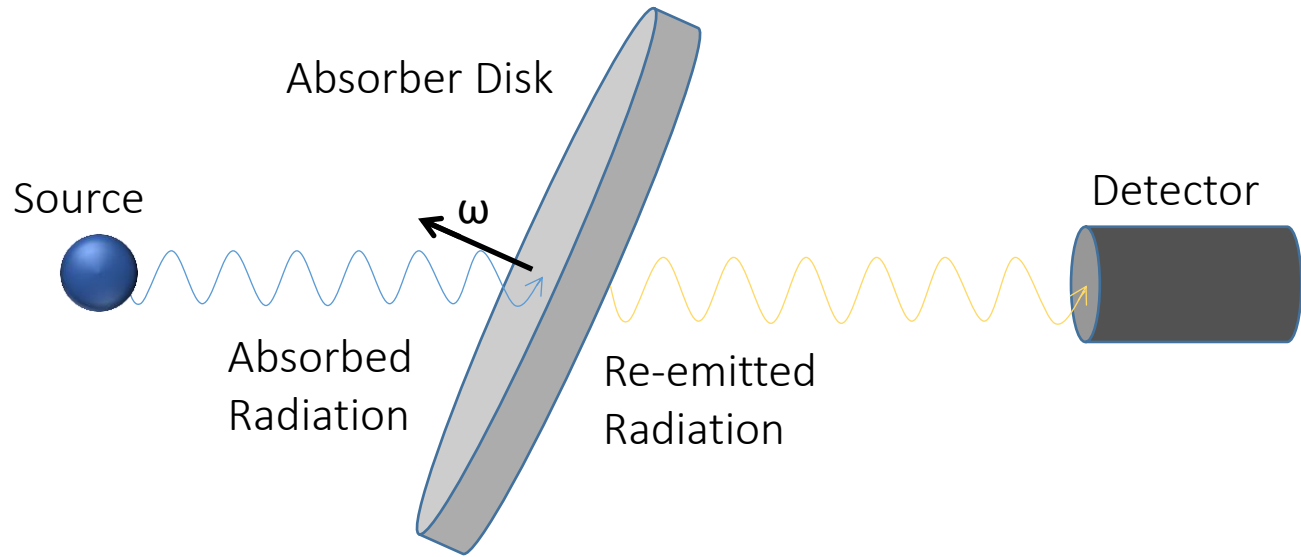


Walter Kündig - 1963

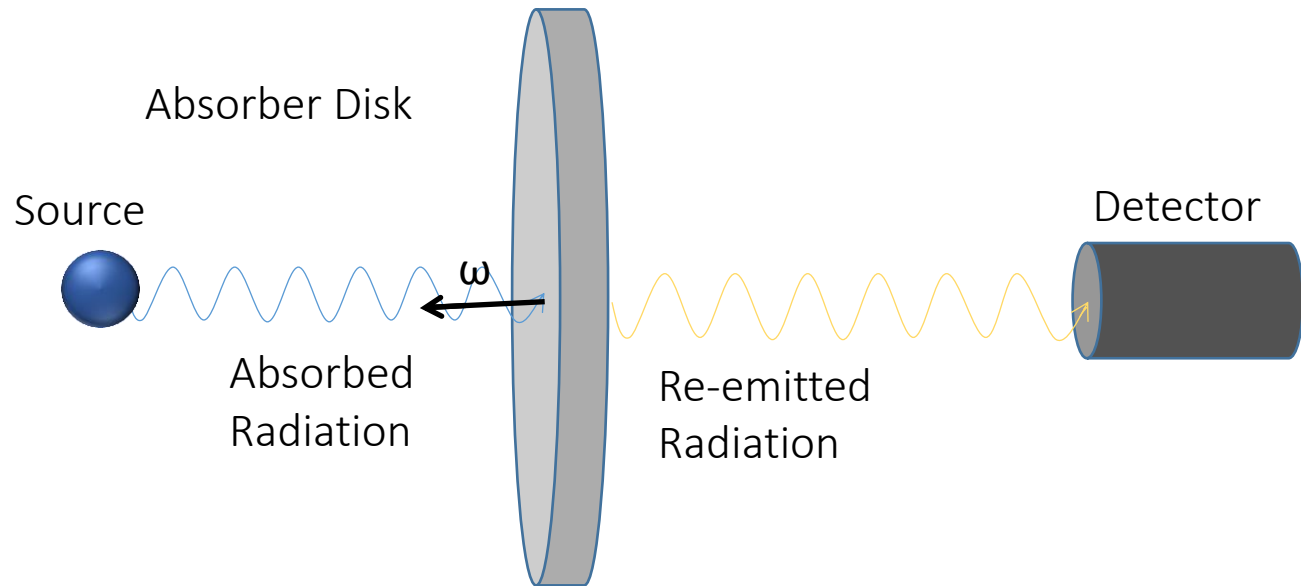


Results agree within an error of 1.1% with predictions made by the theory of relativity.

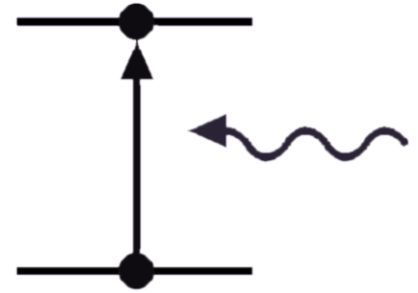
Longitudinal Doppler Effect



Transverse Doppler Effect



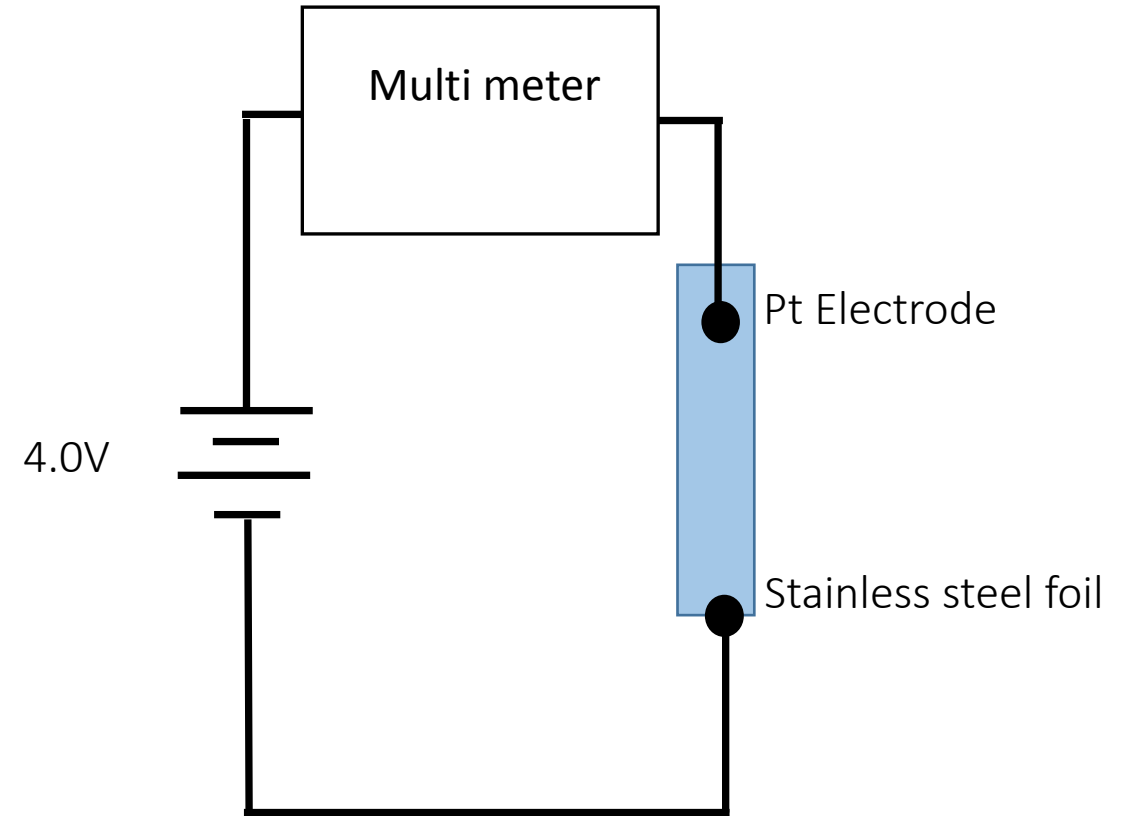
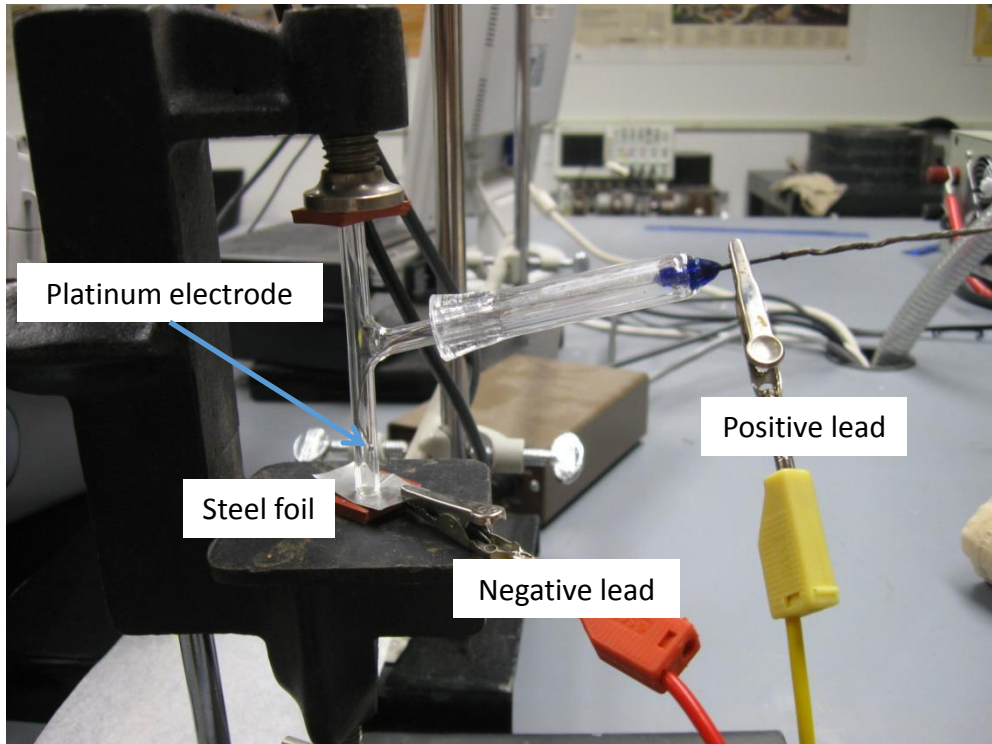
Our Source



- uses an exempt amount of radioactive material
- is heated so the radioactive cobalt diffuses into the steel foil

Making the Radioactive Source

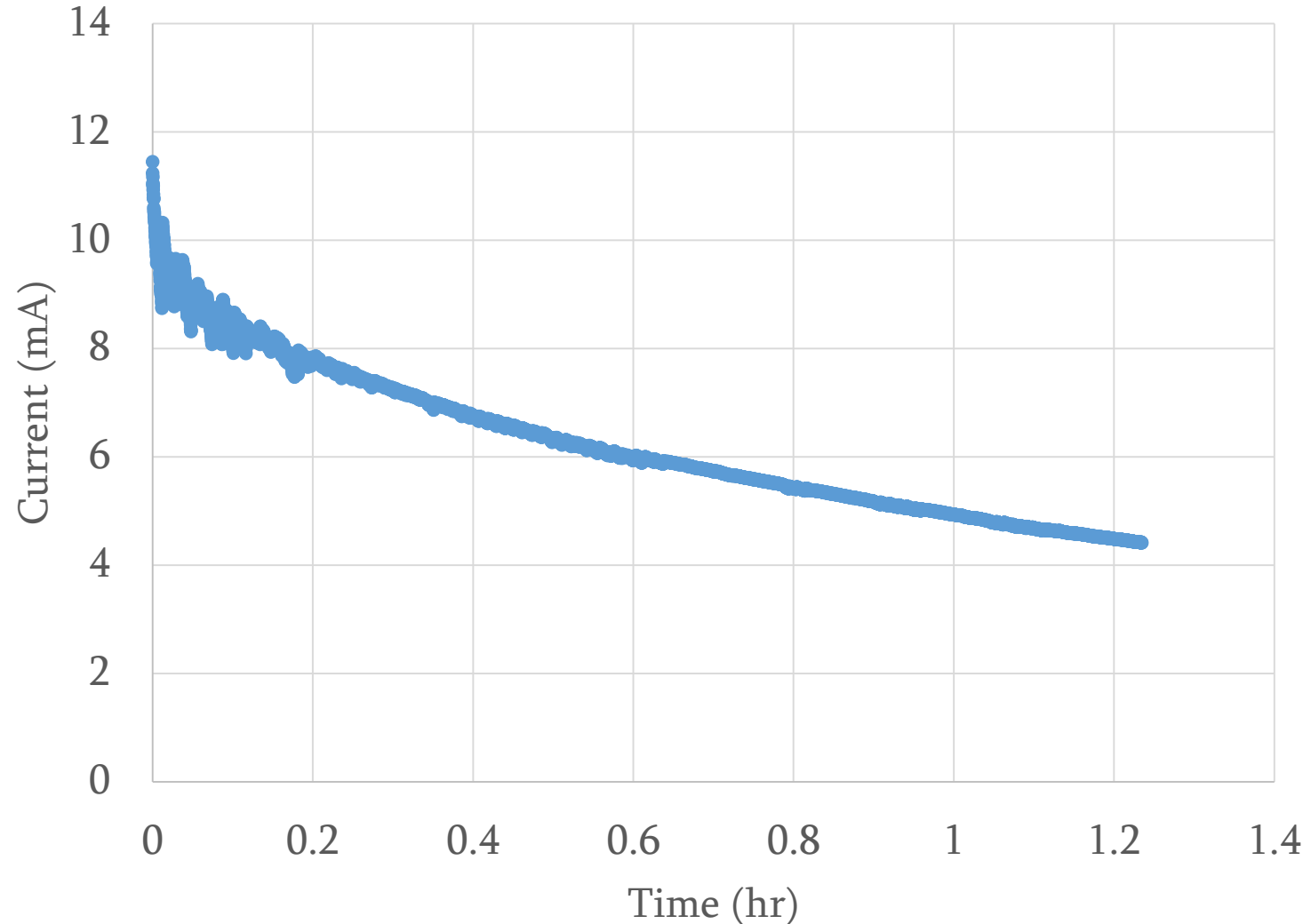
Using Co-57 in HCL solution

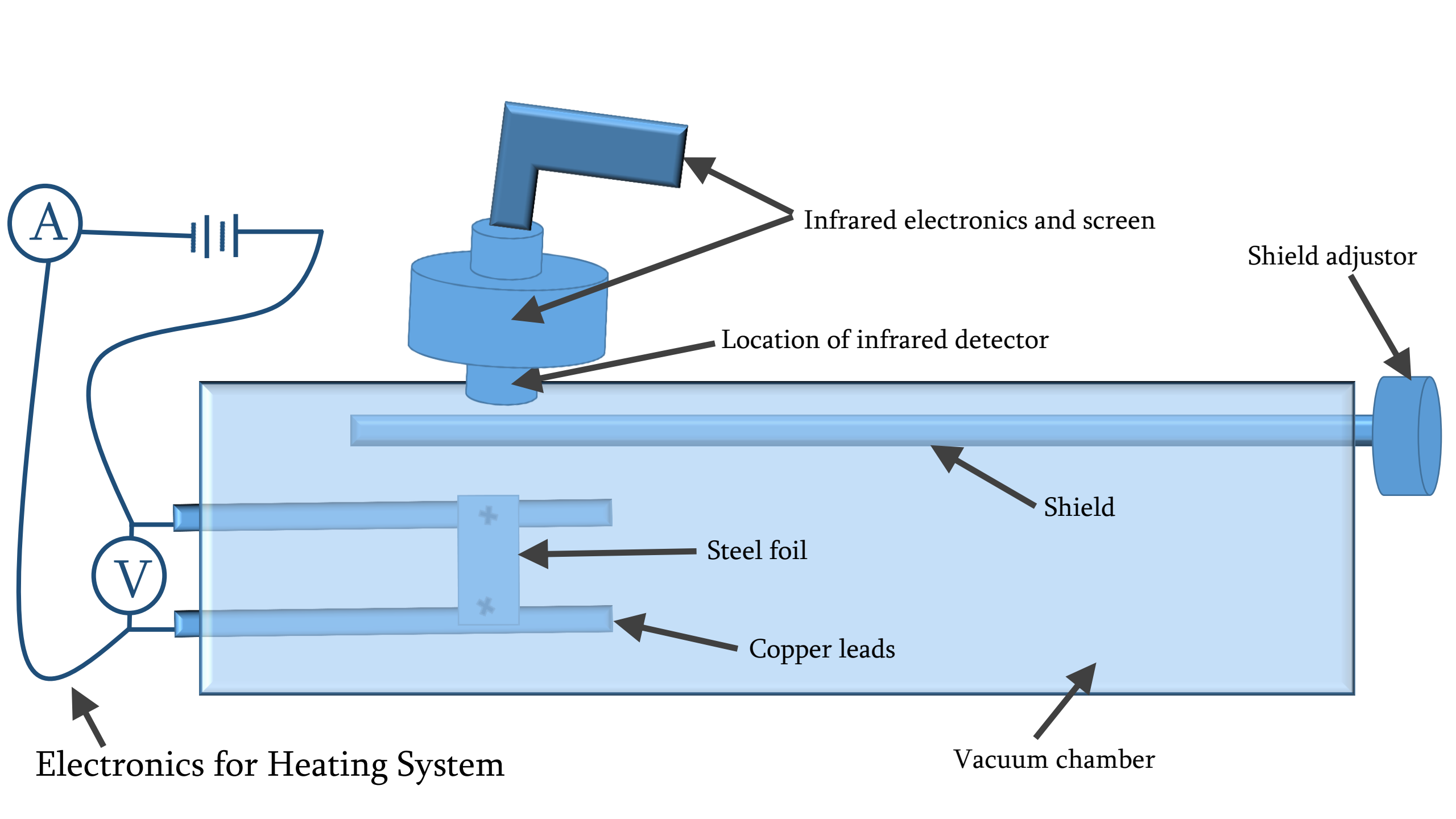


Measuring Temperature Using Infrared detector

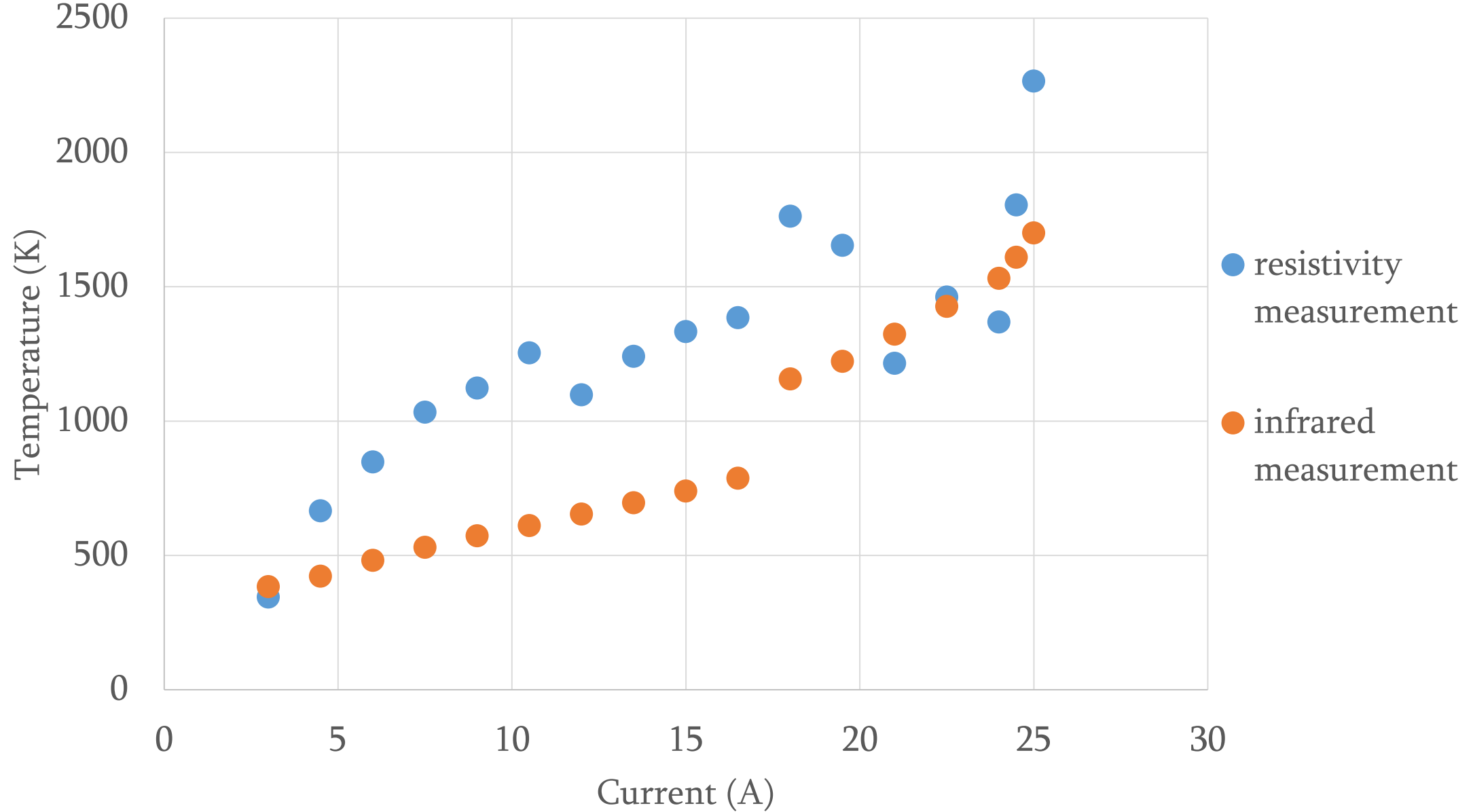
- Change in mass of foil
- Integrate current vs time plot
- Measure radioactivity of source

Electroplating Cobalt onto Steel Foil

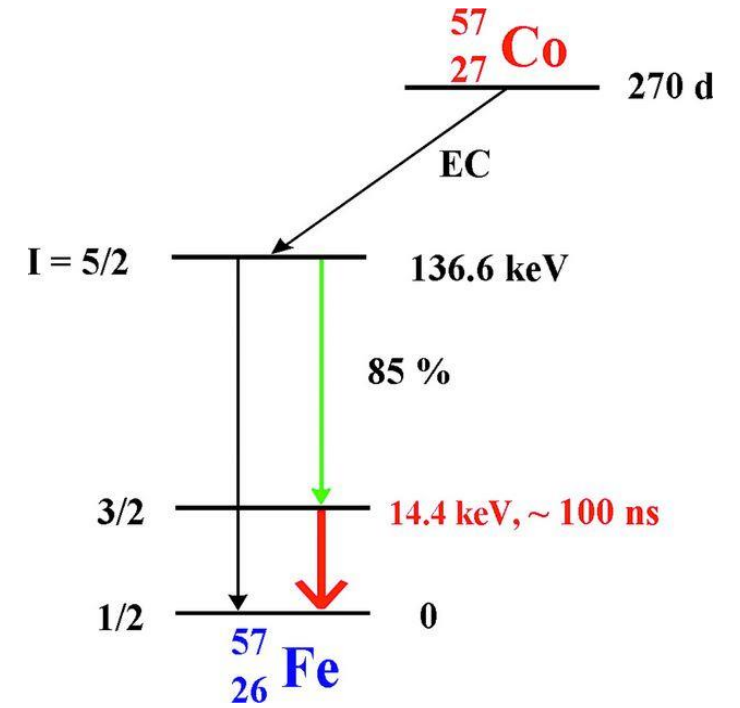
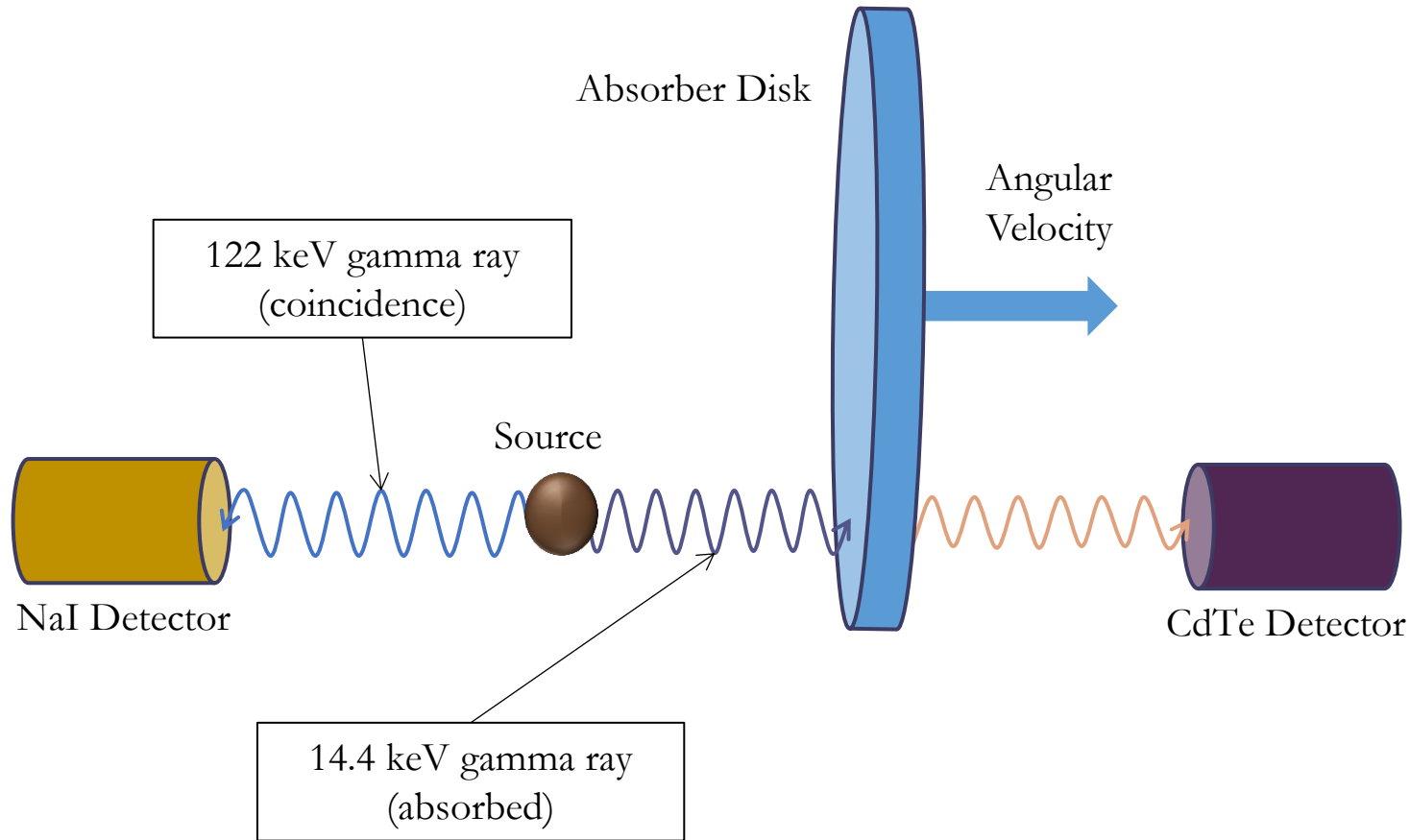




Heating Foil Temperature Measurements



Future Experiment



Questions?