

Exercise set 3: Introduction to EELS

Exercise 1

- Williams and Carter problem Q37.1
- Williams and Carter problem Q37.5
- Williams and Carter problem Q37.7-9
- Williams and Carter problem Q37.21
- Williams and Carter problem T37.11
- Williams and Carter problem T37.12
- Williams and Carter problem T37.13

Exercise 2a

For electrons accelerated a 60 kV, 100 kV, 200 kV, and 300 kV potential, calculate the following properties:

- The velocity v
- The relative velocity v/c_0
- The relativistic correction factor γ

Exercise 2b

In a post column 90° spectrometer or energy filter, the electrons are deflected through an arc of different radius depending on their energy. This results in an spatial dispersion according to energy in the spectrum plane. See figure 1.

Your task in this exercise is to estimate the strength if the magnetic field in such a spectrometer set up for 200 keV electrons. In the TEM exhibit you will find an old GIF200. Go to the lab and measure the parameters you need.

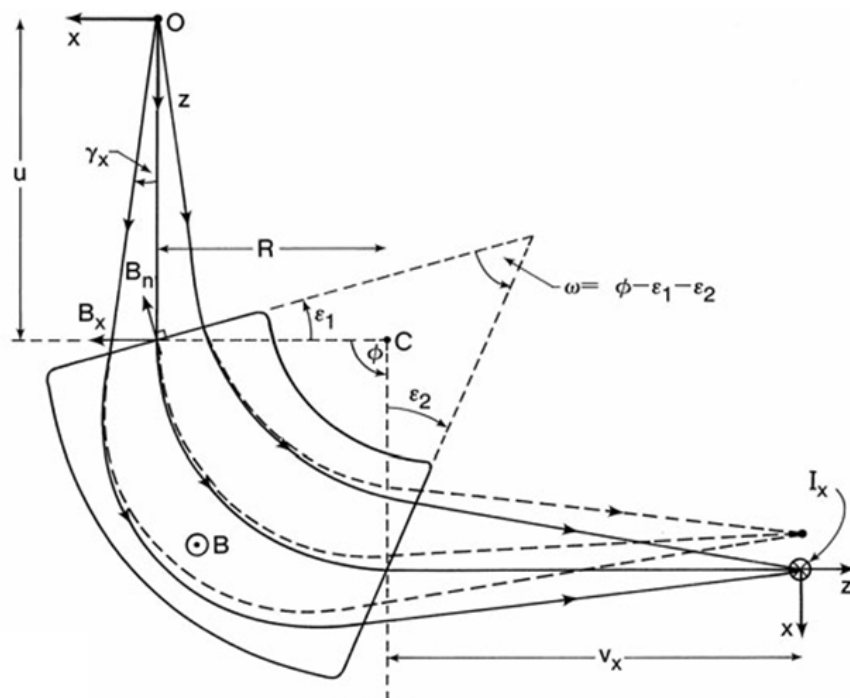


Figure 1: Sketch of a post column 90°magnetic prism spectrometer.