

Warm-up question 1

We want to study the electric charge distribution of the Ca48 nucleus.
For this purpose we can measure:

- A) Cross sections of Rutherford scattering of α particles on Ca48.
- B) Cross sections of elastic electron scattering on Ca48.
- C) Cross sections of inelastic electron scattering on Ca48.
- D) None of them.

Warm-up question 2

Have a look at the differential cross sections in the right.
Which statements are correct?

- A) The two cross sections are obtained by performing $^{48}\text{Ca} + ^{48}\text{Ca} \rightarrow ^{48}\text{Ca} + ^{48}\text{Ca}$ and $^{40}\text{Ca} + ^{40}\text{Ca} \rightarrow ^{40}\text{Ca} + ^{40}\text{Ca}$ scattering.
- B) The two cross sections are obtained from electron scattering $e^- + ^{48}\text{Ca} \rightarrow e^- + ^{48}\text{Ca}$ and $e^- + ^{40}\text{Ca} \rightarrow e^- + ^{40}\text{Ca}$ scattering.
- C) The oscillating shape indicates that the nuclear charge has a “Fermi distribution” (sphere with a homogeneously distributed charge and diffuse radius)
- D) The oscillation shape indicates that the nuclear charge has an exponential distribution
- E) The oscillating shape indicates that the nuclear charge distribution is point-like.
The various peaks indicate various resonances excited by the inelastic collision.

