

Measuring Radon

Experiment overview:

- Radon gas is produced as it is part of the decay chain of naturally occurring uranium and thorium. The amount of radon in a given area will depend on the geography and landscape, for example rocky areas have increased amounts of uranium and thorium. This experiment allows for the study of the decay products of radon.

Equipment:

- CERN@school kit
- Balloon
- String

Detector settings

- Exp. count = 45
- Exp. time = 40 seconds*
- Bias = 95V
- “Integral mode” should be un-checked
- The following depends on your software version, either “Finite number of steps” should be checked **OR** “Continuous measurement” should be un-checked

Method:

- Inflate the balloon, tie and attach to a piece of string.
- Using something woollen, rub the balloon so that it has some charge.
- Set up the CERN@school kit. Arrange the detector in a clamp stand above the desk, with the detector facing down with the cover open.
- Take a background reading (at least 3 minutes' worth).
- Hang up the balloon for at least 30 minutes, ideally away from draughts. After 30 minutes, gently pop the balloon.
- Place the balloon underneath the detector, ensuring it doesn't touch the detector.
- Begin taking measurements. If possible, take measurements for at least 60 minutes.

Analysis:

- Plot the total numbers of alpha, beta and gamma against time.

Suggestions for further investigation:

- Repeat this measurement in a variety of locations and compare the results.

*Please note that we have discovered that the newer version of Pixelman (2.2.3) has a Exp. time limit Of 42 seconds for a single frame, beyond which it won't take longer measurements. In order to take longer measurements, please increase the Exp. count field and take more frames.