

Chapter X

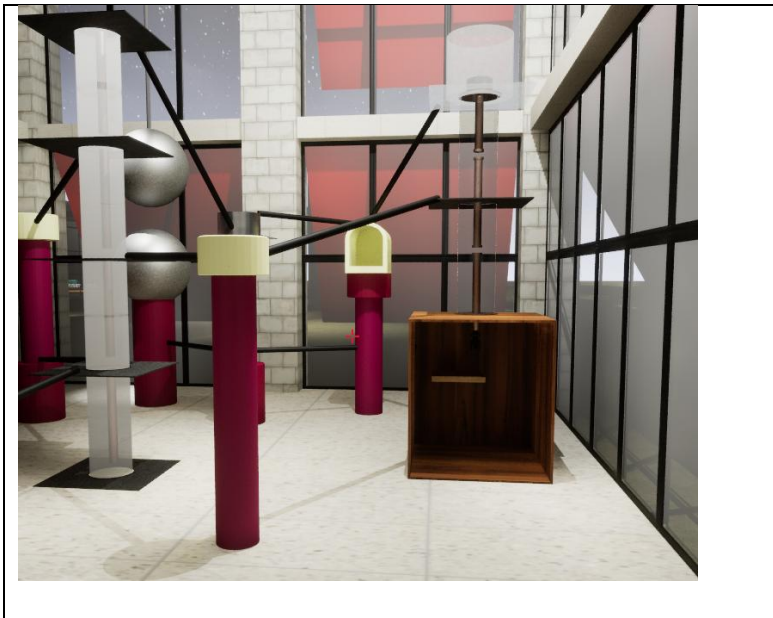
Cockcroft Walton Experiment

X.1 A Brief Introduction

This is a brief introduction to running the Cockcroft Walton accelerator.

X.2 Exploring the Apparatus

(1) Find the experimental apparatus located in the High Voltage lab building, it looks like this, the grey tube stack on the left is the voltage multiplier, the accelerator tube is on the right. Protons are accelerated from the top of the tube and impact on the lithium target placed where the tube enters the 'tea chest'.



(2) Navigate so that your focus is on the accelerator tube and left-click the tube to select it.

(3) Press **L** to extinguish the light and you should see the following information on the HUD.

```

CockWalt
Solver: Runge-Kutta-Fehlberg
time = 579.700000
V = 4.000e+05
spawninterval = 2.000
nr protons emitted = 0
nr protons in flight = 0
Experiment1

```

(4) Press **F1** and you should see protons accelerating down the tube. Press **F1** again to pause.

(5) Press **L** to turn the light back on and navigate inside the tea chest so you are looking into the scintillator eye-piece like this,



(6) Press **L** to turn the light off and **F1** to restart the proton beam. You should see scintillations, and you might also notice that the yellow proton become red alpha-particles.

(7) Pause the proton beam and turn the light on. Now press **Q** to shift the eyepiece out of the way so you can observe alpha particle paths in air. Turn the light off and restart the proton beam.

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X.3 A Simple Experiment

With the proton beam running, press **P** to bring up the parameter menu. You will see that the acceleration voltage is 400 kV. Slowly reduce this value and find the value where the scintillations just stop. This value was observed by Cockcroft and Walton.