

1 Problem Description

The objective of the HW2 is to solve the problem of radioactive decay of C-14 isotope and also to predict the trajectory of the gold ball. The radioactivity and the golf trajectory problem can be solved using the Euler's method and finally write a python code for doing the calculations. Mathematical relations for section can be found below:

2 Solution to Carbon Dating Problem

In this problem we have to derive a relation between half-life time $T_{1/2}$ and decay constant τ , plot the number of particles left vs time over the duration of 20,000 years and with different step size (10, 100, 1000 years)

2.1 Derive analytically the relation between half-life time $T_{1/2}$ and decay constant τ as defined in class.

let,

N = Number of nuclei at any given time 't'

t = time

ΔN = Number of nuclei undergoing decay at time 't'

So, $\Delta N \propto N \cdot \Delta t$

$\Delta N = -\tau N \cdot \Delta t$ Where, τ is the decay constant

2.2 Subtopic 1.2

Your solution and explanation for subproblem 1.2.

3 Solution to Problem 2

3.1 Subtopic 2.1

Your solution and explanation for subproblem 2.1.

3.2 Subtopic 2.2

Your solution and explanation for subproblem 2.2.

4 Contributions

In this section, you can highlight the contributions of your work, such as novel approaches, insights, or findings.