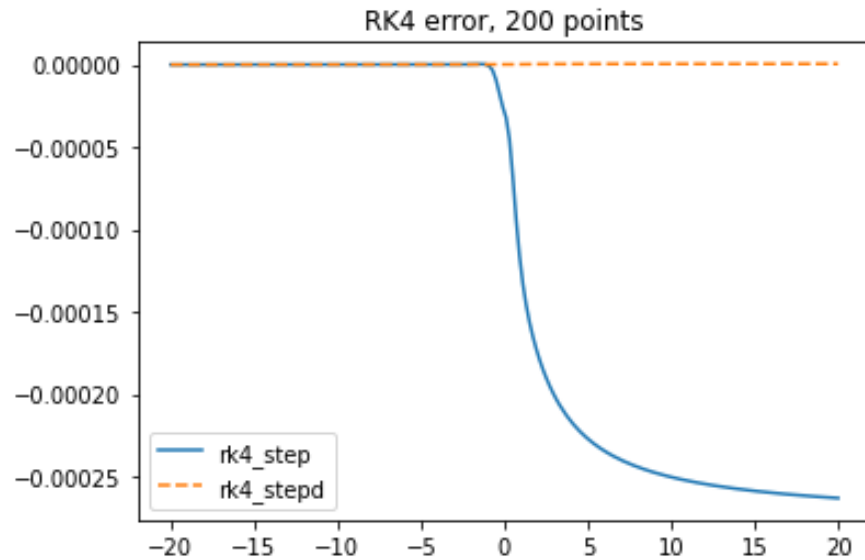


PHYS-512 PS3

Chuyang Li, 260744689

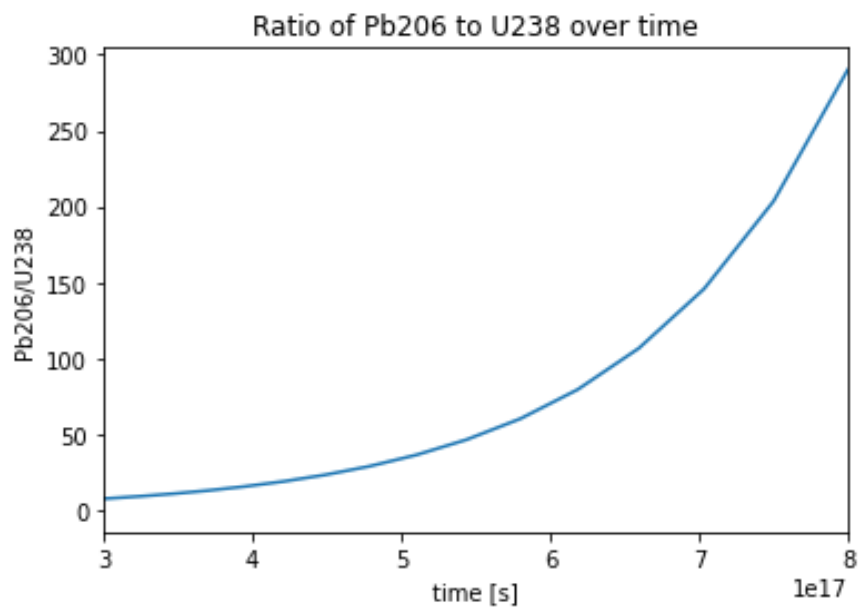
1

As shown in ps3-1.py, there are four function calls per step in `rk4_step`. As a result, there are 12 function calls at each step in `rk4_stepd`. The modified stepper `rk4_stepd` is more accurate by roughly 400 times, as illustrated by the example in this problem.



2

a) The Implicit Runge-Kutta method (method="Radau") is used.



- b) It makes sense analytically, as the half-life of U234 is short compared to that of U238. Therefore, it appears that U234 decays rapidly over a short time span (10^{11} s to roughly $0.4 \cdot 10^{14}$ s).

