PHYS:5905 Homework #2 Solutions, Spring 2019

Name: *Solutions*
Date: 24 JAN 2019

Problem 1: Larmor Motion in constant, uniform magnetic field with zero electric field

1. Trajectory plot is shown in Figure 1.
2. Position x as a function of Time t plot is shown in ...
3. The error in the position at $t = 20\pi$ vs. number of timesteps taken N is shown in plot ...

Problem 2: $\mathbf{E} \times \mathbf{B}$ drift in a constant, uniform magnetic and perpendicular electric field

1. Trajectory plot is shown in ...
2. Position x as a function of Time t plot is shown in ...
3. The error in the position at $t = 20\pi$ vs. number of timesteps taken N is shown in plot ... These results differ from the error plot in problem 1 because ...

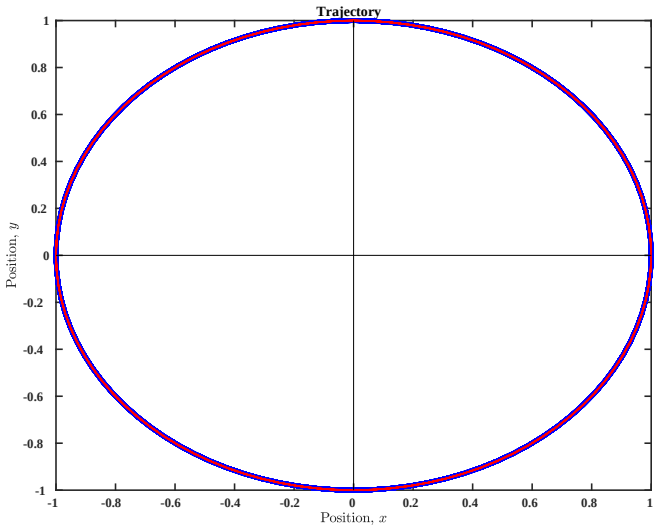

Figure 1: Plot the the trajectory of single particle Larmor motion in the (x, y) for a constant, uniform magnetic field $\mathbf{B} = B_0\hat{\mathbf{z}}$, showing forward Euler numerical integration (red dotted) and the analytical solution (blue solid).