PHYS 6352
April 20, 2014

CHALLENGE 3 (60 pts)

I used the fourth order Runge-Kutta method to solve a second order linear ODE for $y(x)$ from $x = 0$ to $x = 11$. The exact solution is $\cos x$. The plot below shows the error in the solution at $x = 11$. That is, it shows the difference between the computed value of $y(x)$ and $\cos(x)$ at $x = 11$.

Clearly the nature of the error changes around $x \approx 30,000$. Explain the plot, and – most important – explain why the change happens around $x \approx 30,000$. A good explanation is one that would have allowed you to *predict* that the change would have been observed around 30,000.