Ay190 – Worksheet 13
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Date: February 24, 2014

1

Skeletal code is loaded and ready to go!

2

My RHS is an $m \times n$ matrix. The first three columns correspond to coordinate velocities, the last three coordinate accelerations.

I use RK2 integration to solve for the updated coordinate positions and velocities.

3

The energy of the Earth-Sun gradually increases (keeping in mind negative convention), indicating the system is spiraling outwards. See 1.

No difference is observed in changing resolution from 5000 Nsteps to 10000.

4

We simulate sgrAstar for 100 years. The total energy evolves much worse than the Earth-sun system as we can see by comparing to the actual trajectory from UChicago Astro And UCLA astro. In fact, the energy becomes positive after a thresholdof a few years.

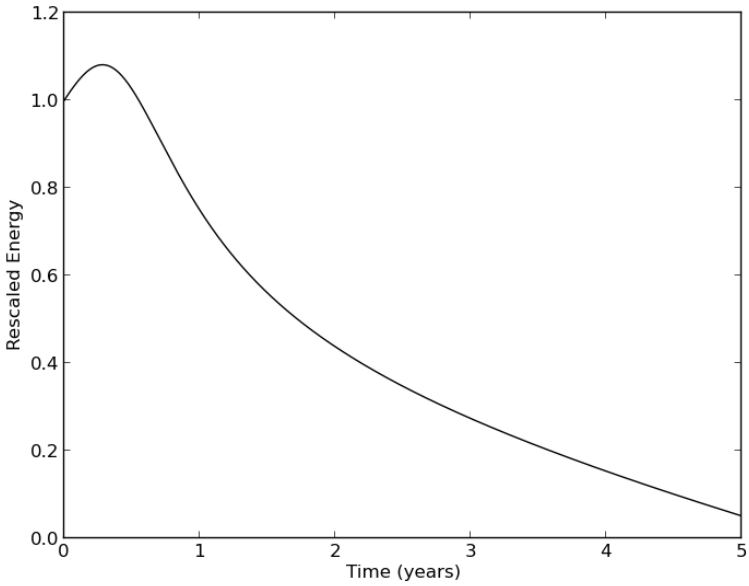

Figure 1: Earth-Sun Energy Evolution