Orbits of Comets

Pranav

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You have to make use of the various ODE algorithm on the two-body problem of comet and sun.Investigate the effect of using various algorithms for the problem. Your final output should be plots of the comet's trajectory and the plot of the energy of he comet(Plot Potential Energy,Kinetic Energy and Total Energy in one plot) for each algorithms. Play around with the time step as well.

The Steps

1. Set initial position and velociy of the comet
2. Set physical parameters(M,G,C,etc..)
3. Loop over desired number of steps and use the choice of algorithm.Also record the position and energy for ploting
4. Graph the trajectory of the comet
5. Graph the energy of the comet versus time.

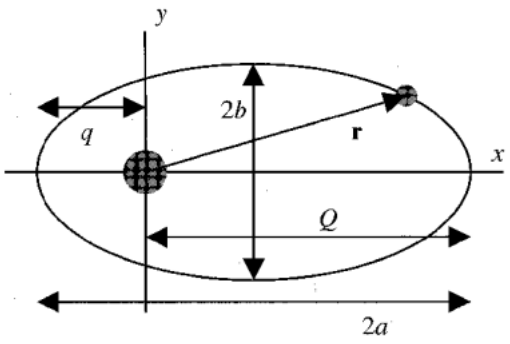

Figure 3.1: Elliptical orbit about the Sun.

Table 3.1: Orbital data for selected comets

Comet Name	T (yrs)	e	q (AU)	i	First Pass
Encke	3.30	0.847	0.339	12.4°	1786
Biela	6.62	0.756	0.861	12.6°	1772
Schwassmann-Wachmann 1	16.10	0.132	5.540	9.5°	1925
Halley	76.03	0.967	0.587	162.2°	239 B.C.
Grigg-Mellish	164.3	0.969	0.923	109.8°	1742
Halc-Bopp	2508.	0.995	0.913	89.4°	1995