13.11: Light-time Correction

Before going further, however, our current estimates of the geocentric distances are now sufficiently good that we should make the light-time corrections. The observed positions of the planet were not the positions that they occupied at the instants when they were observed. It actually occupied these observed positions at times $t_1 - \Delta_1/c$, $t_2 - \Delta_2/c$ and $t_3 - \Delta_3/c$. Here, c is the speed of light, which, as everyone knows, is 10065.320 astronomical units per $1/k$. The calculation up to this point can now be repeated with these new times. This may seem tedious, but of course with a computer, all one needs is a single statement telling the computer to go to the beginning of the program and to do it again. I am not going to do it with our particular numerical example, since the “observations” that we are using are in fact predicted positions from a Minor Planet Center ephemeris.

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