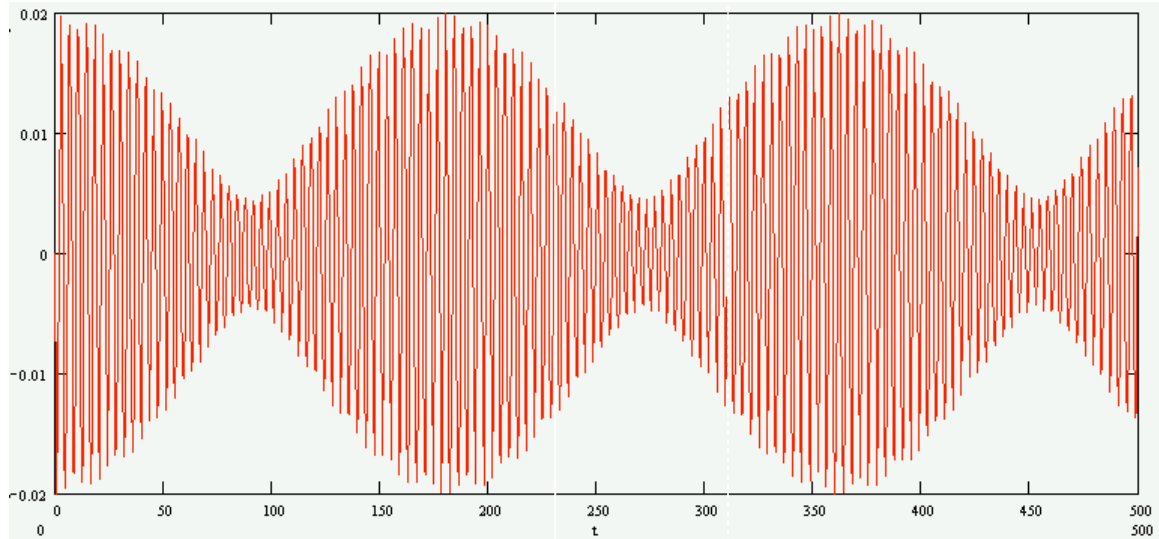


Phys 375 - Homework #5

Getting help on this problem: see pages 6 – 10 of the lecture 7 notes on the course website ([hyperlink is here](#)).



a) The above figure shows simulated interferometer data from a source that creates light at two closely spaced wavelengths, similar to the sodium lamp that we use in Lab 4. The movable mirror for this interferometer is moved by a micrometer which is turned by a motor. For this data,

- the motor turns at 1 revolution per minute (this is different than the motor that we use in our lab, which turns at about 0.5 revolutions per minute),
- the micrometer advances by 0.5 millimeters in one complete revolution,
- the mirror moves one-fifth the distance that the micrometer moves (just like our interferometer).

Note that the x-axis in the figure is time, measured in seconds. (*Also note that our photodiodes always produce positive voltages, unlike the above data, which also has negative values.*)

- a) Count a reasonable number of fringes in the above figure to measure the average wavelength of the light source. (This will turn out to be in the infrared range.)
- b) List approximate values of the time when the fringe visibility is high, and approximate values of the time when the fringe visibility is low. List all such values that you can identify.
- c) What is the difference in the two wavelengths?