ASTP720
Homework 7
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Repository: https://github.com/wjwainwright/ASTP720

Discussion

Given the time crunch of getting all these assignments done on time, I had to use numpy's FFT method to save time. I created the frequency array using the Nyquist frequency as the cutoff. I constructed a plot of the power spectrum vs frequency, and found the position of the spike in the signal. The frequency at which this spike occurred was $0.00220375Hz$, with a strain of $6.328826094262944e-22$. This gives the system a mass of $1.3869277048001234M_{\odot}$ and a separation of $0.6585315503485444R_{\odot}$. This is consistent with the theoretical mass limit of a white dwarf being $1.44M_{\odot}$. Given more time, I would certainly have taken a crack at writing my own FFT algorithm.

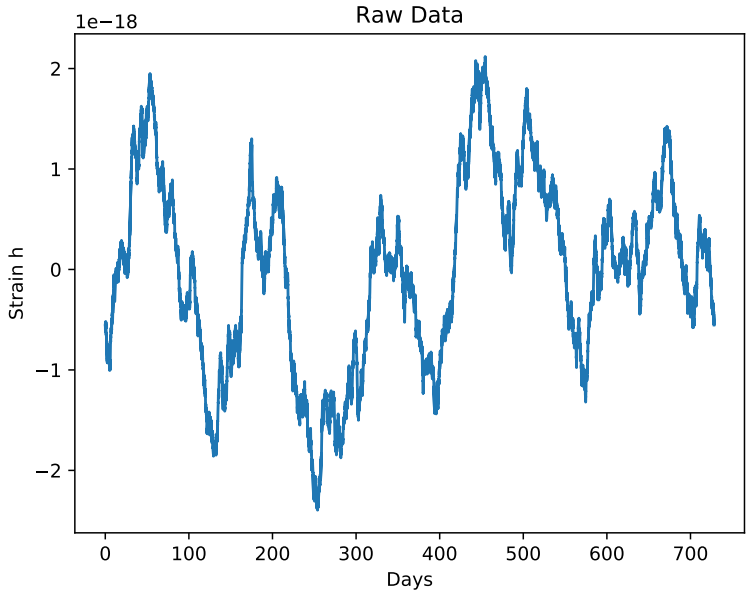

Figure 1: Plot of the strain data over the 2 year period.

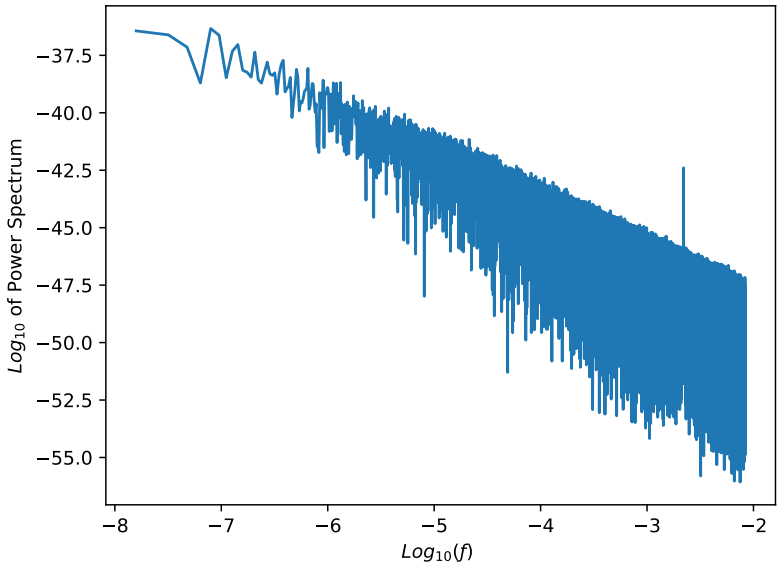

Figure 2: Plot of power spectrum of the FFT. Normalized by dividing by N data points and multiplying by 2.