Project Status for GD 358

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Based on the new input and data we have received, our goal stays the same, and the process to get there has not differed. The goal of this project is to confirm the pulsation periods, which we can detect, given prior resources from accepted research papers.

We are using AstroImageJ to perform Differential Photometry on our target to gather the time series from it. Using the background stars which are not variables to do so. The time series is then put into Period04 which calculates the Fourier series and creates an Amplitude Spectrum of the star. Based on the fluxes received from the comparison stars and GD 358. The Amplitude Spectrum allows us to see the pulsation amplitudes given at a specific frequency. These amplitudes and frequencies are then confirmed from the ones found in the research papers.

Using the 1-meter telescope, with the SBIG imaging CCD, at the Embry Riddle, Daytona Beach campus. We are using the G-filter because our target peaks in this range, thus we can get the most out of the data. We calculated an SNR of 500 for GD 358, which gives us an exposure time of around 20 seconds. None of this was mentioned for us to change in the TAC meeting, so we assume this is sufficient.

We have one night of data, gathering 151 images each with a 60-second exposure, this was done before calculating the 20-second exposure. The run was around 3 hours and 16 minutes of observing time giving an image cadence of 77.881 seconds. We have analyzed the data we do have, making a Time Series (Figure 1) and the Amplitude Spectrum (Figure

2) from Period04. This single night of data cannot prove the pulsations are real and won't match with those already found until we have more data.

We have two to three nights more planned so that we may confirm the pulsations. One of these nights will be using SARA's Kitt Peak telescope which will give us more accurate data. We will be using a V-filter at Kitt Peak because they do not have a G-filter, thus V is the closest so we may have consistent data. However, the exposure time will be different due to the better conditions. Since the location is dryer, less cloudy, and has better visibility due to pollution.

Once we have compared all of our data to that of the known pulsations from accepted papers. We will be able to determine if the ones we found are viable or not. Maybe even finding a new pulsation from GD 358 which exists that the previous researchers either were not able to measure or missed.

Figures

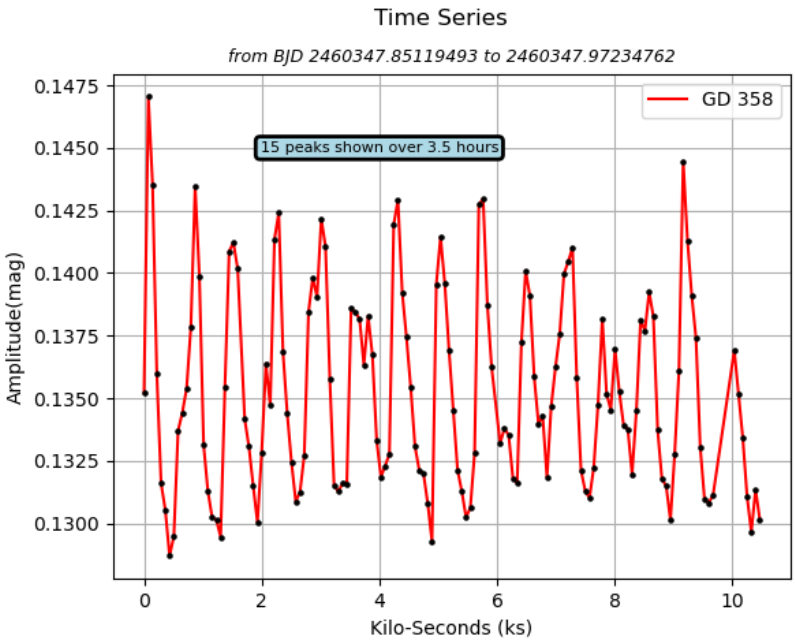

Figure 1: The Time Series of GD 358 made in Python with data analyzed in AstroImageJ.

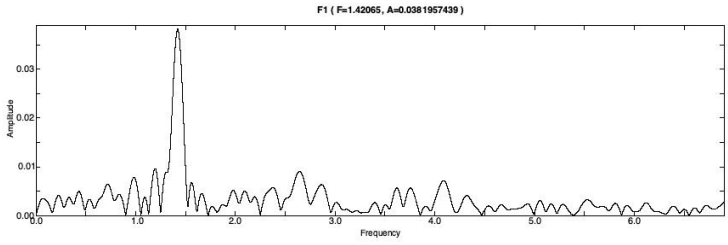

Figure 2: The Amplitude Spectrum made from the Fourier analysis in Period04.