Update on DAMP 17 G29-38 as of Nov 12, 2020

We have had a really good run on G29-38, especially considering that there was no formal planning for this run. The current light curve is shown below.

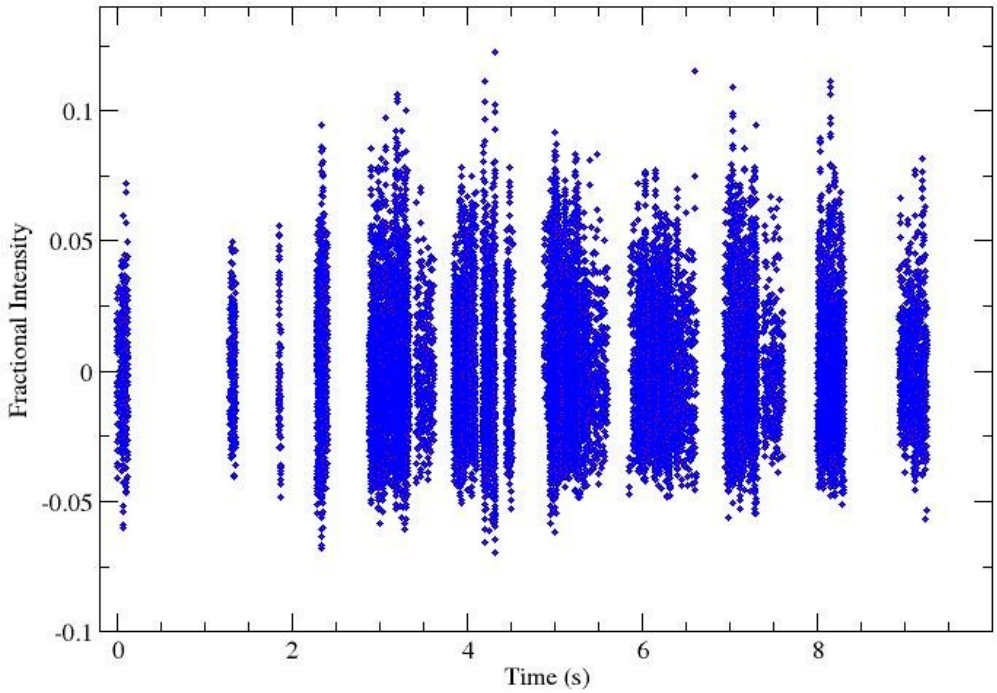

Figure 1: Light curve for G29-38 as of November 12, 2020. The data spans over 9 days, with very good coverage. The x-axis gives time in days, not seconds. The y axis gives the fractional intensity in units of mmi.

The run spans over 9 days. We have data from 8 observatories, as well as multiple PROMPT telescopes. The weather was good, so we have achieved good coverage. The only remaining gap is the infamous Hawaii gap. I have been told that the IRFT got very good data, however. Once we can add that to the light curve, the gap will be filled.

Figure 2 is the current DFT for the DAMP17 data set.

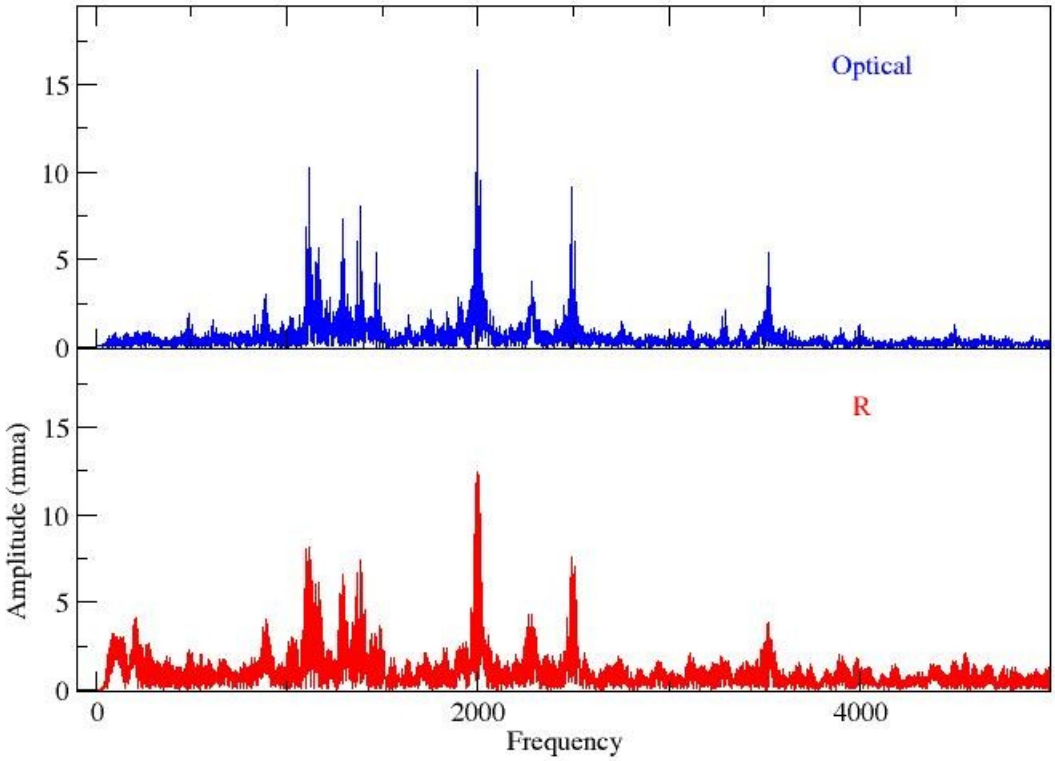

Figure 2: Current DFT of the DAMP17 data set as of November 12. The top panel gives the FT of data taken with the BG40, V, and g filters as shown in Fig 1. The bottom panel shows the DFT of simultaneous R data from Suhora Obsevatory.

Frequency Analysis:

While G29-38 is currently pulsating with multiple frequencies, most of those frequencies appear to be singlets. As an example, Figure 3 shows the largest amplitude peak at about 2000 microHz, compared with the spectral window. Prewhitening the light curve by this frequency does not leave any significant peaks behind. Preliminary analysis finds 15 independent frequencies and a nearly equal number of combination frequencies (a few frequencies are suspected combinations awaiting identification). Assuming the independent frequencies are all spherical harmonic index of 1,
then there is an average period spacing of about 38 s.

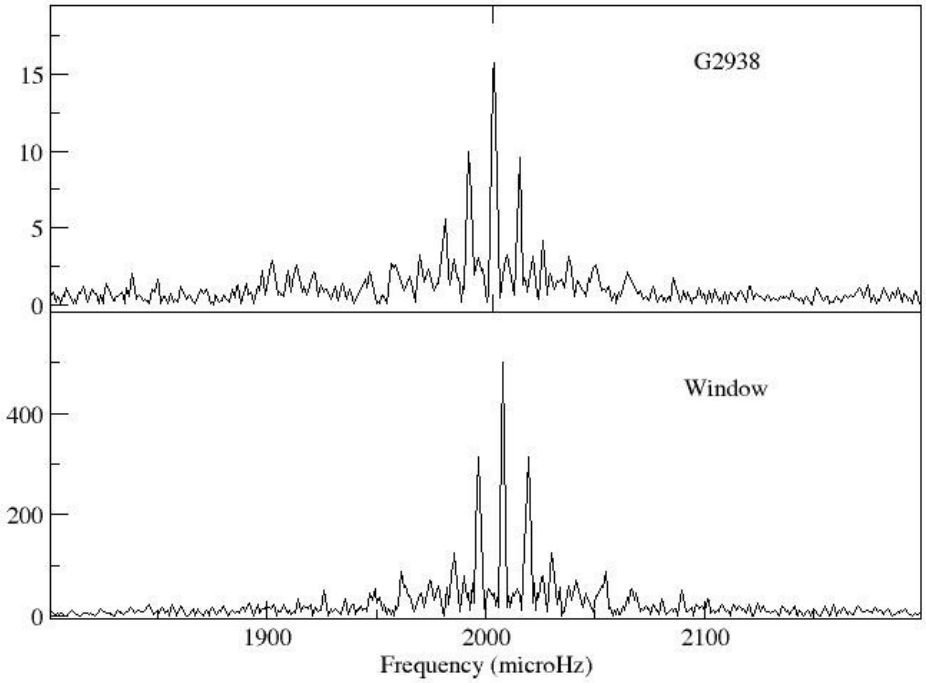

Figure 3: An example of prewhitening. The top panel shows the largest amplitude peak in G29-38's dft. The bottom panel shows the spectral window (the pattern created by a single sinusoid sampled exactly as the data). The two are nearly identical, indicating that this frequency is not complex. (Note: ignore the strange y axis values for the spectral window.)

Finally, Table 1 gives the list of frequencies (in microHz and mma).

g2938_freq_1110

label	freq	freqerr	amp	amperr
f2-f0	491.618938484897	0.016869495544683	1.85673069829962	0.136853145493732
f0-f3	617.649405510587	0.018571297173151	1.57545365792475	0.13674903042154
f0-f1	886.44272820479	0.015474547090716	2.38974716639587	0.136663237990134
f1	1114.40783841156	0.013159150758525	10.4126521210263	0.136846164828678
f4	1166.19820168877	0.02370416564761	5.97101177730519	0.136868460759934
f5	1292.36230992214	0.01970751033547	7.21587492172988	0.138409432380327
f13	1297.09855648076	0.036455526621962	4.03505892191317	0.138477083031829
f3	1383.20116110576	0.016813947209115	8.17823822446858	0.137232405740554
f6	1470.20876806699	0.025240631198338	5.38613043709411	0.137129093684425
f11	1633.3880922853	0.089032268344892	1.58735067692668	0.137139726250309
f10	1750.72221083045	0.063824267008145	2.21315889659167	0.137100975205776
f9	1836.48127689393	0.056056083345962	2.51869972738413	0.136887442807195
f8	1899.94694441402	0.054037853972029	2.61269732197061	0.136895068392317
f0	2000.85056661635	0.008214511328996	16.2452936417974	0.136915542312281
f7	2280.79791555533	0.049985491098351	3.49232964221163	0.141813056455097
f14	2282.43673020724	0.051886210811151	3.36518870112067	0.141747720655682
f2	2492.46950510125	0.014688804181572	9.30202159775558	0.136800895188797
f15	2747.47923144675	0.092922489924234	1.51351972794579	0.136703214574017
f0+f1	3115.25840502791	0.015550604004083	1.62734419012373	0.136794920184179
f0+f5	3293.21287653849	0.021114232495564	1.89341249377864	0.136875564646384
f0+f3	3384.05172772212	0.01885420270699	1.18782063851044	0.136931862142461
f0+f6	3471.05933468334	0.026447192557155	1.49375445950614	0.136744385817556
f12	3522.71477783092	0.025637292379681	5.44444730619627	0.136775697800166
f16	3896.22333296396	0.133350459943753	1.05559634230476	0.136851161385356
f0+f0	4001.7011332327	0.016429022698309	1.3264471463079	0.136859343433671
f0+f2	4493.3200717176	0.016789831744907	1.37423981566269	0.136684479243689
f0+f12	5523.56534444727	0.026860031741506	0.756059064947509	0.136646815012173
f0+f0+f0	6002.55169984906	0.024643534047463	0.109598636144805	0.136687957083345