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PG 2337+300: A NEW CATAclySMIC VARIABLE

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The star PG 2337+300 was identified as an ultraviolet excess source by the Palomar-Green survey (Green, Schmidt & Liebert 1986). It was given the spectroscopic designation “sd” (subdwarf), presumably based on a low signal to noise spectrum showing some moderately broad Balmer absorption lines. Wesemael et al. (1992) classified the star as a B-type subdwarf on the basis of Strömgren system photometry ($y = 13.91$, $b - y = 0.06$, $u - b = 0.127$, $m_1 = 0.06$).

PG 2337+300 was observed for three hours with the two-channel Louisiana State University Photometer attached to the 0.9m telescope at McDonald Observatory (Fort Davis, Texas). The observations commenced on JD 2450752.6996 (October 31.195, 1997), and consisted of a continuous sequence of 10 second integrations, with occasional interruptions to measure the sky background brightness. No filter was used (in order to maximise the count rate) and the effective bandpass is roughly similar to Johnson B , though broader. The observations are plotted in the top of Figure 1. Simultaneous measurements of a comparison star, made with the second channel of the photometer, showed a flat light curve with $\sigma = 0.008$ mag.

A spectrum of PG 2337+300 (exposure time of 45 minutes) was obtained JD 2450756.6677 (November 4.167, 1997) with the 2.7m telescope at McDonald Observatory using the Large Cass Spectrograph, a $600\ell/\text{mm}$ grating (blazed at 4200 \AA), and the TI1 800×800 CCD. This particular grating/detector combination yields a spectral resolution of $\approx 3.5 \text{ \AA}$ (FWHM). The spectrum (normalized to its continuum fit) is shown in the bottom of Figure 1. The Balmer lines ($H\beta$ to $H9$) have broad line wings in absorption and sharp emission cores. In addition, there is a HeI absorption line at 4471 \AA and an emission line at $\approx 4650 \text{ \AA}$ probably due to C III/N III.

The irregular photometric variations with a typical timescale of a few minutes, the blue colour, and the emission lines provide unmistakable evidence that PG 2337+300 is a cataclysmic variable and not a normal subdwarf B.

References:

- Green, R.F., Schmidt, M., Liebert, J., 1986, *Astrophysical Journal Supplement*, **61**, 305
Wesemael, F., Fontaine, G., Bergeron, P., Lamontagne, R., Green, R.F., 1992, *Astronomical Journal*, **104**, 203

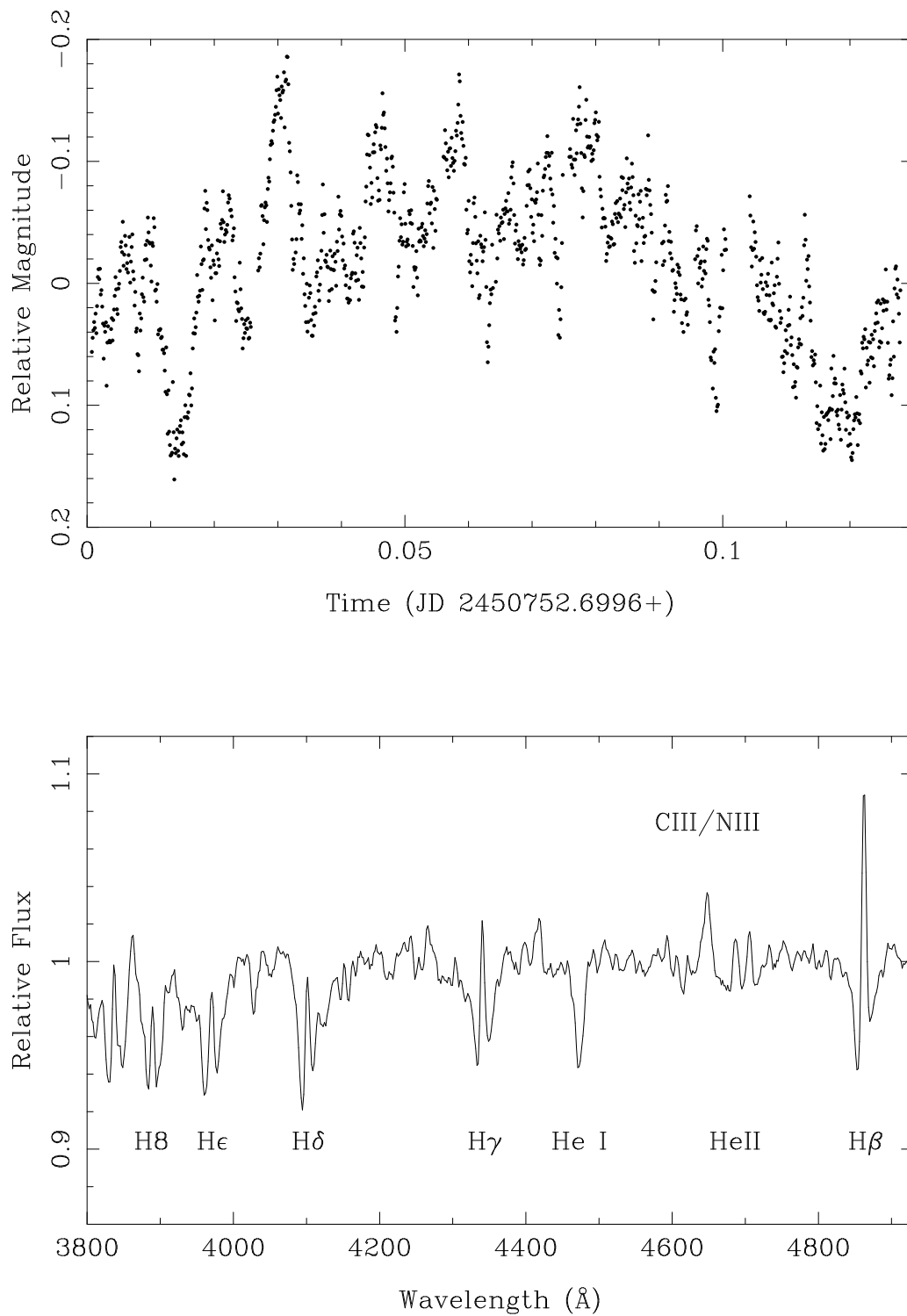


Figure 1. Top: High speed photometric observations of PG 2337+300 from October 31, 1997. Bottom: The normalized spectrum of PG 2337+300. The signal-to-noise ratio is ≈ 30 near H β and ≈ 20 near H8.