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DISCOVERY OF RAPID OSCILLATIONS IN THE Ap STAR HD 150562

The cool Ap star HD 150562 was monitored photometrically for 4.67 hr on the night JD 2448411 as part of the *Cape Rapidly Oscillating Ap Star Survey*. Inspection of the real-time data display at the telescope indicated the presence of rapid oscillations with a period $P = 10.75$ min and amplitude $A = 0.75$ mmag (Fig. 1). The observations were acquired using the St Andrews Photometer attached to the 1.0-m telescope at the Sutherland site of the South African Astronomical Observatory.

The data were acquired in continuous 10-s integrations through a Johnson *B* filter with occasional interruptions for sky background measurements. An autoguider was used to track an off-axis guide star thus minimizing the effect of light variations caused by tracking errors in the telescope. The data were corrected for coincidence-counting losses, sky background, extinction and some long-term ($P > 0.5$ hr) trends caused by sky transparency variations. The data were then binned to 40-s integrations. The resulting instrumental magnitudes were not placed on the standard system.

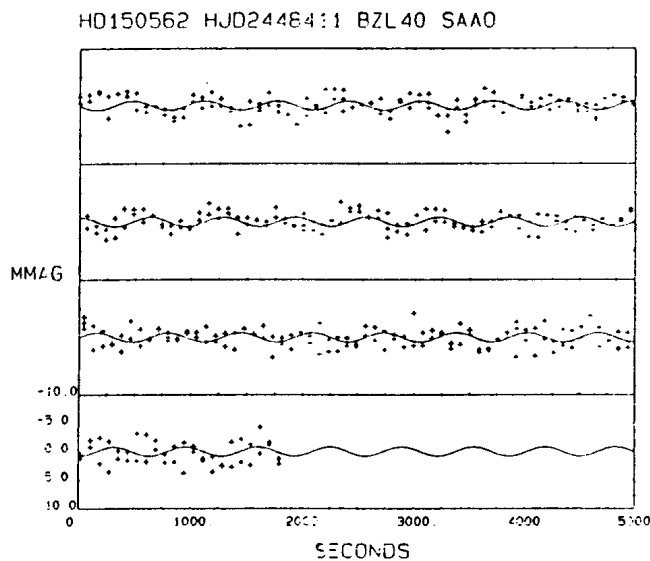


Figure 1

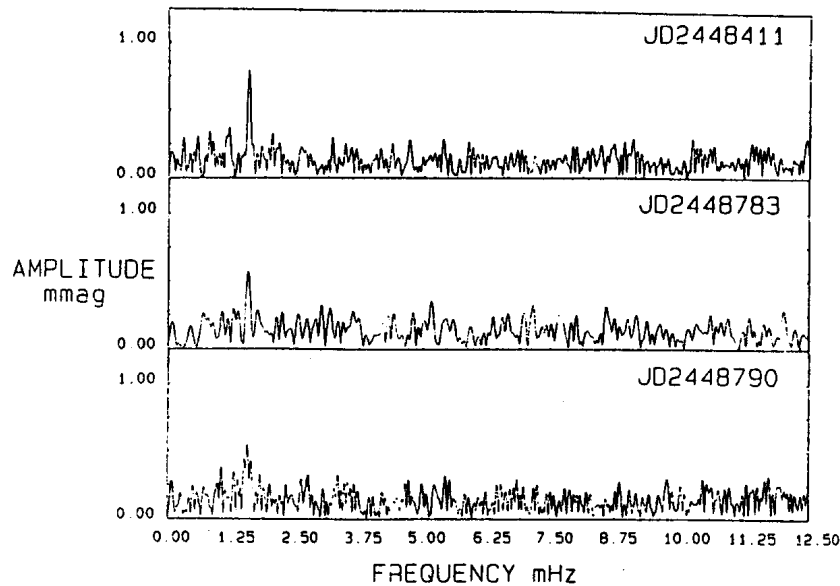


Figure 2

To confirm the presence of rapid oscillations, we observed this star again on nights JD2448427, 8462, 8465, 8723, 8783, 8786, 8790 and 8792. In Figure 2 we show the amplitude spectra acquired on three good nights. The prominent peak is at $\nu_1 = 1.55$ mHz. The solid line in Fig. 1 is a sinusoid of frequency $\nu_1 = 1.55$ mHz, with least-squares-fitted amplitude and phase, which has been plotted to facilitate the reader's perception of the oscillations.

Inspection of all available amplitude spectra suggests that the oscillations in HD 150562 are amplitude modulated. To refine our determination of ν_1 and to search for additional frequencies, we Fourier analyzed the last four nights together. However, the daily aliases are too severe to accomplish either of these goals. The value of ν_1 is ambiguous by 1 cycle day⁻¹ in these data; we cannot distinguish between $\nu_1 = 1.5585$ mHz and $\nu_1 = 1.5470$ mHz. Further observations and a detailed frequency analysis of the rapid oscillations of HD 150562 will be presented in a future publication.