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NEW OBSERVATIONS OF THE DELTA SCUTI VARIABLES SIGMA OCTANTIS AND B OCTANTIS.

SIGMA OCTANTIS

The A7n star σ Octantis (= HR 7228 = HD 177482) was first recognized as a δ Scuti variable by McInally and Austin (1978). Our observations of this star were made on the 17th and 19th July, 1981 using a photoelectric photometer attached to the 41 cm telescope of the Monash observatory. The standard star chosen, o Octantis (= DM -89 1 = SAO 258218), proved to be constant over the two nights observations, while σ Octantis varied with a single period of 0.097 day and a visual light range, ΔV = 0.025 magnitudes (c.f. results of McInally and Austin: period = 0.100 day, ΔV = 0.03 magnitudes).

Figure 1 shows the data collected and the reconstructed light curve from Fourier analysis of these data. Our results indicate that σ Octantis is probably a δ Scuti star undergoing radial pulsation in the fundamental mode only.

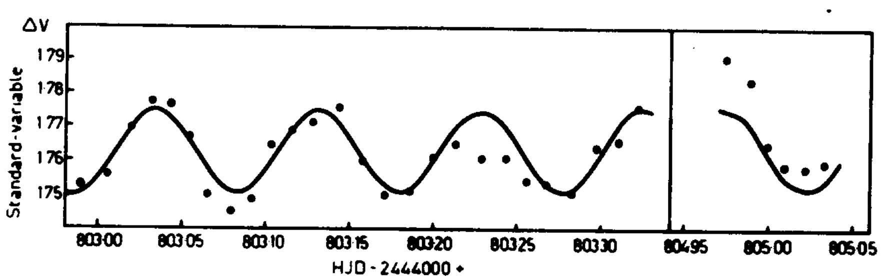

Figure 1

B OCTANTIS

B Octantis (= HR 8294 = HD 206553) was first reported as a δ Scuti variable by McInally and Austin (1978). On the basis of two nights observations they reported a period of 0.064 day, a visual light range of 0.010 magnitudes, and noted that the star exhibited a highly variable amplitude.

Using the 41 cm telescope at the Monash Observatory, B Octantis was observed on the 17th and 19th July, 1981 (see Figure 2). Fourier analysis of the data obtained revealed a period of 0.063 day and a visual light range of 0.010 magnitudes; this is in excellent agreement with the results of McInally and Austin. In addition another period of 0.143 day with a visual light range of 0.014 magnitudes was located. The standard star chosen was o Octantis (= DM -89 1 = SAO 258218); both standard and variable lie within $1\frac{1}{2}^{o}$ of the south celestial pole, hence the air mass through which they are observed remains virtually constant. o Octantis gave a constant signal throughout both nights.

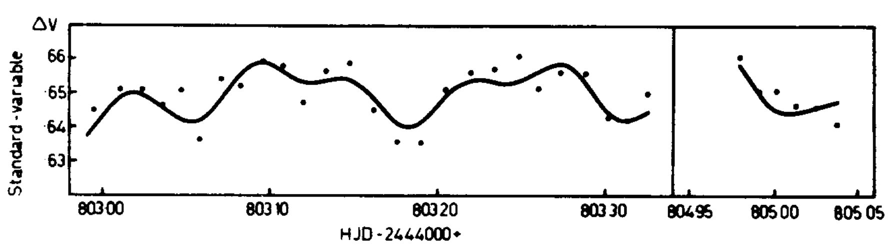

Figure 2

B Octantis was again observed on the 9th, 14th and 20th September, using the same equipment. However we altered the observing technique by measuring B Octantis continuously, interspersed at about half-hour invervals with single (2 minutes) observations of the standard. Fourier analysis of these data again revealed the same periods. Figure 3 gives the data obtained and the reconstructed light curves from Fourier analysis of these data.

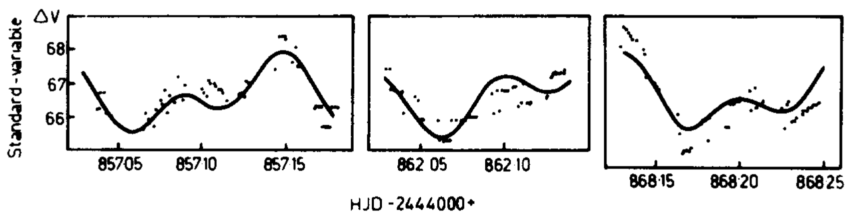

Figure 3

These two periods give a period ratio of 0.44 which cannot be attributed to any commonly observed modes of radial pulsation. Breger (1979) gives the observed period ratios for radial pulsation in δ Scuti stars as $P_1/P_0 = 0.76$, $P_2/P_0 = 0.60$, $P_2/P_1 = 0.81$, and $P_3/P_2 = 0.845$. Breger (1979) also points out that non-radial modes of pulsation have only been well established for a few δ Scuti stars. Because the light variations of B Octantis are small, further observations may not reveal more structure in the light curve. We plan to measure colour indices of this star in an effort to locate its exact position within the δ Scuti instability strip.

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