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INFRARED PHOTOMETRY OF BETA LYRAE

As part of our on-going program of infrared observations of close-contact and peculiar binary systems, we have been making photometric observations of Beta Lyrae since 1977. We are using the 1.3-meter with the "Otto" InSb detector at Kitt Peak National Observatory; most of the observations were made during the day. The beam size was 32"; chopping of 60" was done in declination. The standard star for all observations was Alpha Lyrae, whose magnitudes on the Kitt Peak scale are: J (1.2 microns) = +0.013, H (1.6 mcrons) = 0.005, K (2.2 microns) = 0.015, L (3.5 microns) = -0.019, and M (4.6 microns) = -0.045. Extinction corrections were usually small (<0.01 mag) at all wavelengths. One observation cycle (standard-source-standard) took about 5 minutes to achieve a signal-to-noise ratio $\geq$100

Figures 1-5 summarize the results to date. Statistical errors for each datum are smaller than the sizes of the symbols, which indicate the year of observation. Phases were calculated from JD = 2439935.86 + 12.9327 E (Rocznik Astronomiczny, 1976). Beta Lyrae is known to go though large changes of period (Kreiner, 1978; Bahýl´, 1979); we have not corrected for these changes in our figures. Despite this, the infrared light curves are remarkably consistant from year to year.

Previous infrared observations of Beta Lyrae have been reported by Jameson and Longmore (1976) and Viotti et al. (1978). Jameson and Longmore's data are from 1973-1974 and include observations at 8.6 microns. Our observations have many more data points to more clearly define the shape of the infrared light curves. Viotti et al. (1978) do not present any light curves but do report J = 3.28, K = 2.99, L= 2.82, and M = 2.78 at phase 0.14; our values at the same phase are: J = 3.26, K = 3.06, L = 2.84, and M = 2.68.

Note that the depth of the primary eclipse decreases relaive to the secondary eclipse at longer wavelengths. Our data give primary eclipse magnitudes

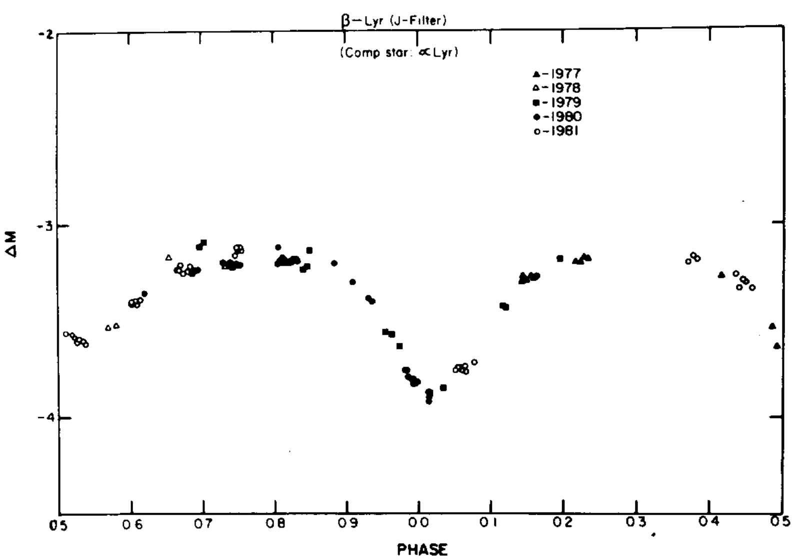

Figure 1

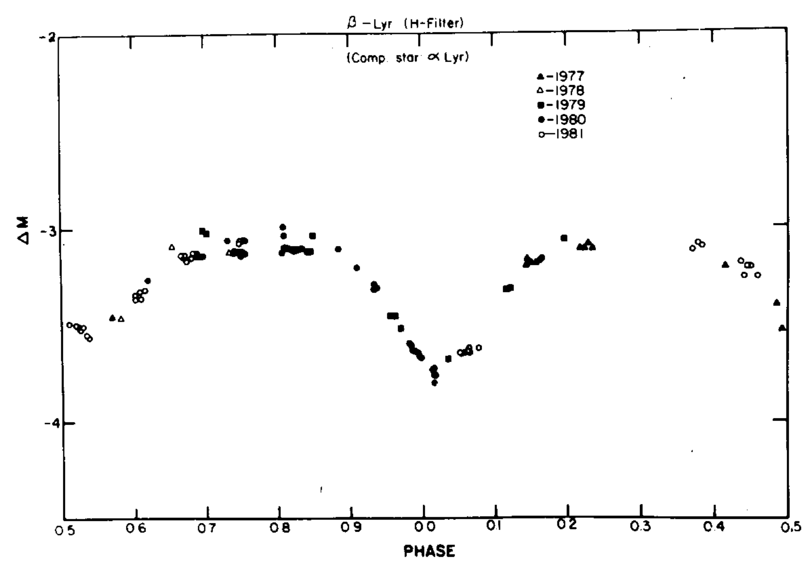

Figure 2

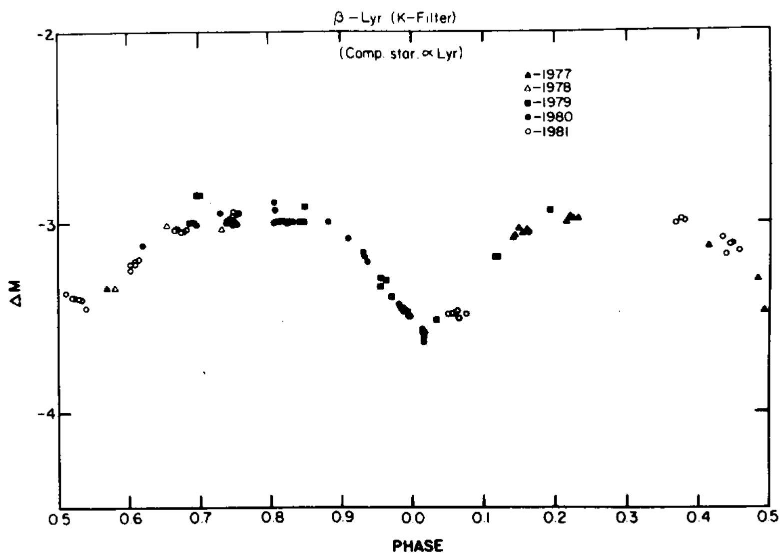

Figure 3

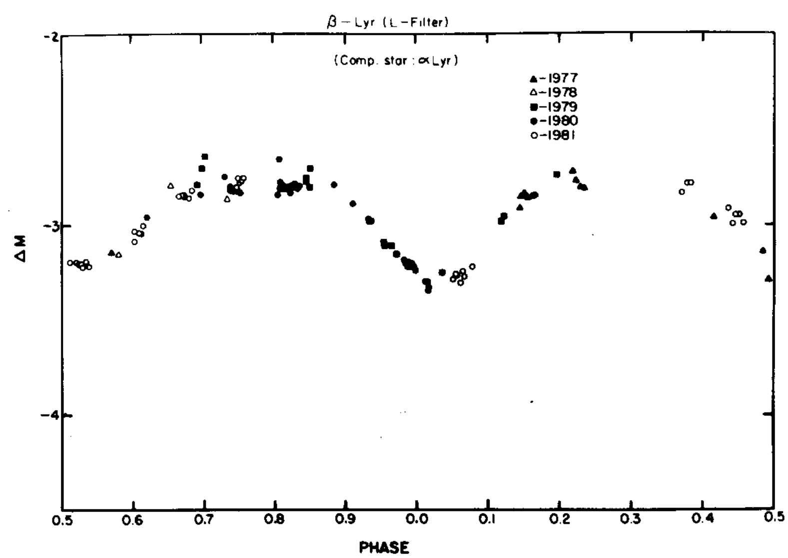

Figure 4

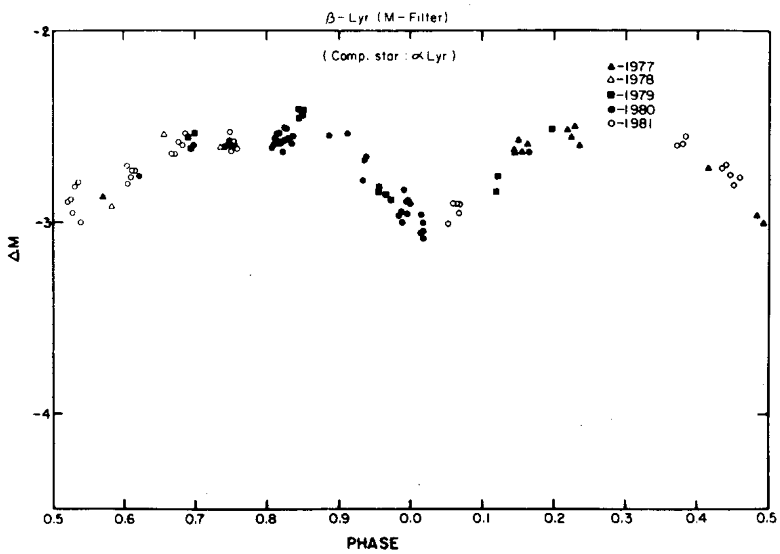

Figure 5

as: J = 3.84 ± 0.06, H = 3.69 ± 0.07, K = 3.54 ± 0.07, L = 3.23 ± 0.6, and M = 2.90 ± 0.08; and secondary eclipse magnitudes as: J = 3.57 ± 0.09, H = 3.49 ± 0.09, K = 3.36 ± 0.10, L = 3.16 ± 0.08, and M = 2.83 ± 0.09.

We plan to continue this program in 1981-82 to fill in gaps in the light curve.

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