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SPOT OBSERVATIONS OF EV Lac

Presented here are the preliminary results of our photometric observations of the spotted flare star, EV Lac. In particular, this paper discusses the results of this last season of observation covering the period from August 1986 to December 1986 and its noted differences from that of previous observations. We also suggest a more suitable second comparison star than the one in standard use. The present observations were taken with the 41 cm telescope at Table Mountain Observatory in four colors (UBVR) using a pulse counting photometer. Carol Ambruster has also provided some data taken with the 36 inch reflector at Kitt Peak. A more detailed report of our results and methods of analysis will be forthcoming in another publication.

In 1983, EV Lac was found to vary with a total amplitude in V of 0.08 mag. and a period of 4.375 days (Pettersen et al. 1983). These data were taken between June 1979 and December 1981. In 1985, we began our observations and found no discernible variation of the star. This period of nonvariability was later confirmed by other observers (Skiff, Brian, private communication) (Melikan, N.D., Melkonian, A.C., private communication).

In August of 1986, we started observing EV Lac again and found a new variation of 0.13 mag. as opposed to Pettersen's (1983) 0.08 mag. Pettersen's period of 4.375 days was assumed, and found to fit our data very well. There was, however, a phase shift noted from Pettersen's (1983) ephemeris, as one would expect if observing a new spot. The phase difference was measured to be -0.236 phase or -1.033 days. We therefore propose a new ephemeris for maximum

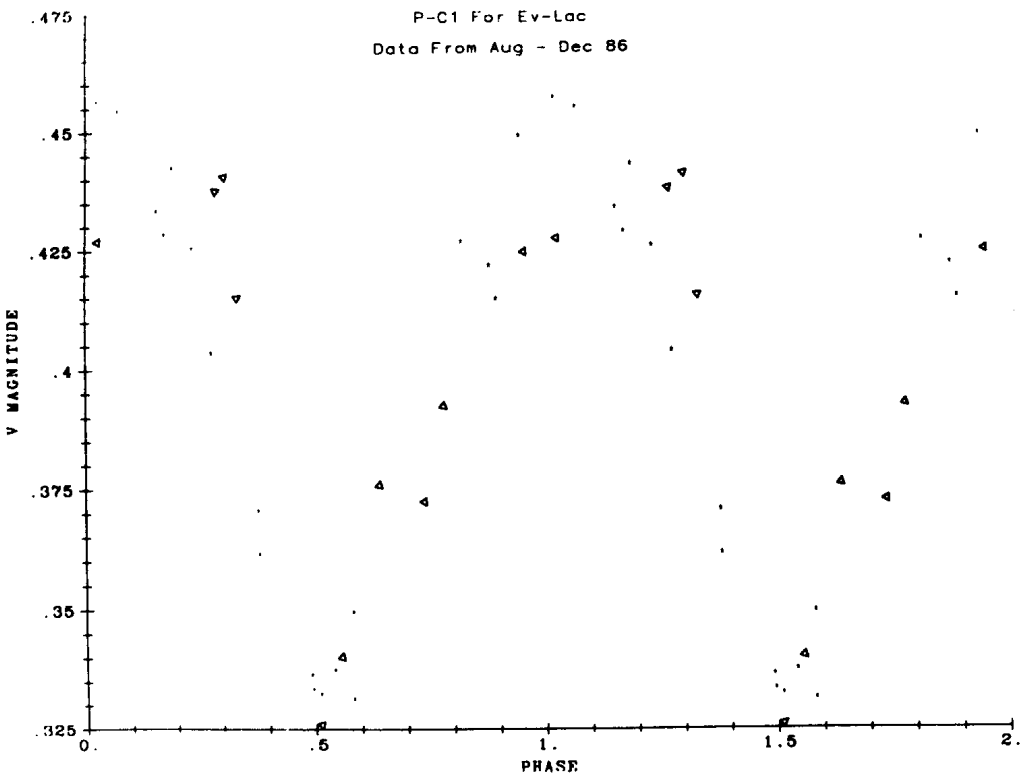

Fig. 1. (P-C1) V magnitude vs. phase for EV Lac. The starred points were taken at Table Mountain and the triangles at Kitt Peak.

spot visibility to be JD 2446499.18 + 4.375*E adjusted from Pettersen's (1983) result for both the phase difference and the approximate appearance data of the new spot. Figure 1 is a plot of the differential V magnitude in P-C1 vs. phase using our new ephemeris. The starred points are the points taken at Table Mountain, and the triangles are those from Carol Ambruster at Kitt Peak.

Pettersen (1983) reported no noticeable variation in the V-R. Our new results, however, do suggest a small but visible variation of 0.03 mag., again suggesting a newer, larger spot than previously observed.

We have long been suspicious of the comparison star, C2, proposed by Pettersen (1980) and which has recently been confirmed to be variable (Tsvetkov et al. 1986). The C2 we have employed is SAO 052337, an 8.9V, K2 star which has worked quite well. It is also close enough to EV Lac and the standard C1 so that differential extinction is not usually a problem.

We would be grateful for correspondence regarding any data you might have that may help in defining this new variation or its connection to past observations.

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