INFRARED MICHELSON INTERFEROMETRY OF ZETA AURIGAE TYPE SUPERGIANTS

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The system parameters of the ζAur-type binaries, all containing a cool supergiant and a hot dwarf,have been improved recently by IUE observations (N.P.Schroeder,1985;A.Ap.147,103). But the diameters of the supergiant components,determined with different indirect methods,are still discordant. We attempted to solve such discrepancies by measuring directly the angular sizes of these stars, expected to be of a few milli-arcseconds.

The measurements were performed by using a modern Michelson stellar interferometer (A.Labeyrie,1975;Ap.J.196,L71),operating at the CERGA Obs. in France. The fully developed instrument (Blazit,Bonneau,Josse,Koechlin, Labeyrie and Oneto,1977;Ap.J.217,L55),equipped with an infrared beam recombination table (Di Benedetto and Conti,1983;Ap.J.268,309), was used in collaboration with A.Blazit,D.Bonneau,R.Foy and Y.Rabbia of CERGA.

In the infrared,the contribution of the hot dwarf is almost negligible, and so we could observe the interferometric effects depending on the supergiant's finite angular size. The fringe visibility in the H and K atmospheric windows was measured with different baseline lengths,up to 55 m. Already from rough data,it appears that ζAur, 31 Cyg and 32 Cyg are all clearly resolved at 1.65 μm with the longest baselines (an example is given in Fig.1). This means that such measurements may provide angular diameters of these supergiants, with well established reliability (G.P. Di Benedetto,1985;A.Ap.148,169). Data analysis is in progress.

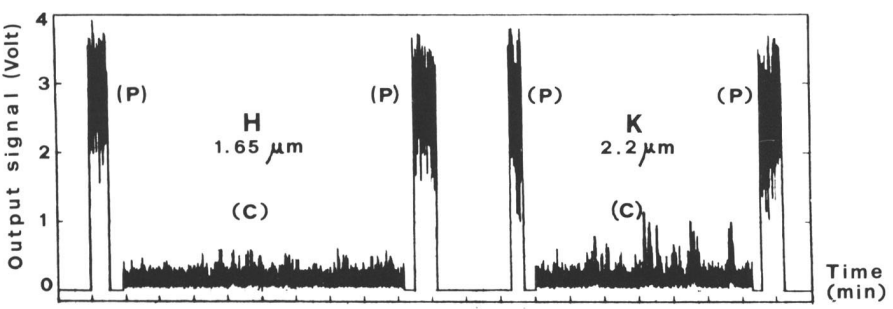

Fig.1. Total photometric energy (P) and coherent energy (C), recorded from 32 Cyg with 50 m baselength, on 11/10/85. The spikes in (C) show the fringe signal detected in a scan of the coherence region (FWMH~10 μm): the signal is lower in H than in K, while the mean photom. energy is almost the same in the two cases. This indicates that the source is clearly resolved in H, the point-source transfert function being about the same for H and K.

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