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Hα, OI - PHOTOMETRY OF THE HYADES AND COMA BERENICES CLUSTERS

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RESUMEN. Se presenta fotometría α(16)Λ(9) para cincuenta y nueve estrellas en las regiones de las Hyades y de Coma Berenices. En el diagrama α(16)Λ(9) los siguientes grupos de estrellas de tres cúmulos galácticos quedan separados de la secuencia principal y entre si: estrellas Am, estrellas Ap, estrellas de luminosidad IV-III y estrellas con líneas muy anchas (n).

ABSTRACT. α(16)Λ(9)-photometry for 59 members of the Hyades and Coma Berenices is presented. In the α(16)Λ(9) plane the following stellar groups of three open clusters are separated from stars of the Main Sequence: **Am stars, Ap stars, classes III-IV and broad line star(n).**

I. INTRODUCTION

We have obtained, in the past, α(16)Λ(9)-photometry for a number of early type stars (Mendoza 1979; Mendoza et al. (1983), Am stars (Mendoza 1976b), and Ap stars (Mendoza 1977). We have also obtained α(35)Λ(16)-photometry for 44 Hyades stars (Mendoza 1976a).

This paper presents α(16)Λ(9)-photometry of 30 cluster members of the Hyades and 29 Coma Berenices stars.

II. OBSERVATIONS

Most of the observations have been carried out with the 40-inch telescope of Observatorio Astronómico Nacional at Tonantzintla in 1976-9; but an important minority were made with the 33-inch telescope of Observatorio Astronómico Nacional at San Pedro Mártir, in 1981-3. These observations were obtained in the α(16)Λ(9)-photometric system which has been defined elsewhere (see for instance Mendoza 1975 and 1985). The results are summarized in Table 1. The left side corresponds to the Hyades-photometry, and the right side to Coma Berenices observations. The columns in each side of Table 1 contain, first, the Henry Draper Catalogue (HD) number; second and third the α(16) and Λ(9) indices (in magnitudes); and last, the number of different nights that each star was observed.

III. CONCLUSION

It is well known that the Hyades is an excellent choice for a standard open cluster with which other stellar aggregates and field stars can be compared. The α(35)Λ(16) photometry of the Hyades indicates that Am stars are separated from normal main sequence stars (Mendoza 1976a,b) in the α(35)Λ(16)-plane.

The α(35) (B-V) diagram shows (Mendoza 1976a), that the Hyades A-Vn stars lie above, but very close to the normal main sequence. This is not clearly shown in the α(35)Λ(16)-array.

It is also known that Coma Berenices has a deficiency in metals compared with the Hyades (see for instance Mendoza 1963). The main sequence in Coma Berenices includes Am, An and Ap stars (Mendoza 1963, Cowley et al. 1969).

TABLE 1

H_α, OI-PHOTOMETRY (in magnitudes)

THE HYADES				COMA BERENICES			
HD	α(16)	Λ(9)	n	HD	α(16)	Λ(9)	n
26015	1.193	0.305	4	105805	1.332	0.328	5
27176	1.263	0.330	2	106103	1.189	0.296	1
27383	1.119	0.290	6	106691	1.190:	0.341:	1
27397	1.255	0.349	2	106946	1.209	0.299	3
27459	1.293	0.330	5	106999	1.316	0.346	3
27524	1.165	0.302	6	107131	1.309	0.332	6
27628	1.257	0.306	4	107159	1.236	0.344	3
27749	1.279	0.301	5	107168	1.356	0.343	6
27808	1.133	0.281	7	107276	1.329	0.346	3
27819	1.331	0.347	18	107326	1.247	0.335	4
27836	1.087	0.285	6	107513	1.254	0.352	3
27901	1.173	0.309	1	107655	1.378	0.302	4
27934	1.334	0.345	5	107700	1.112	0.290	4
27962	1.351	0.333	4	107935	1.276	0.325	3
28024	1.238	0.337	4	107966	1.361	0.351	5
28052	1.246	0.337	3	108007	1.277	0.324	5
28294	1.217	0.321	2	108102	1.095:	0.292:	1
28307	1.190	0.264	2	108283	1.261	0.353	5
28319	1.306	0.351	60	108382	1.347	0.355	16
28527	1.333	0.353	2	108486	1.345	0.314	5
28556	1.275	0.334	2	108519	1.253	0.336	4
28910	1.283	0.323	2	108642	1.321	0.318	7
29375	1.228	0.329	2	108651	1.331	0.322	9
29388	1.355	0.343	2	108662	1.338v:	0.285v:	12
29488	1.317	0.337	2	108807	1.157	0.287	3
30034	1.276	0.326	2	108945	1.387	0.281	6
30210	1.325	0.319	2	109030	1.394	0.275	3
32301	1.325	0.342	2	109307	1.364	0.355	4
37147	1.296	0.325	2	111812	1.090	0.309	2
40932	1.319	0.335	2				

Our results are illustrated graphically in Figure 1 through the α(16)Λ(9)-plane, where the coding is solid line the A0-G2 normal main sequence, derived from the bright stars (Mendoza 1985), and open circles, crosses, and dots for the Hyades, Coma Berenices and A0-A2 Pleiades stars, respectively. The Pleiades data are taken from Mendoza (1979); the data for the Hyades and Coma is given in Table 1.

Figure 1 shows:

1) The Pleiades A0-A2 stars of luminosity class V (see Mendoza 1956) have much less "cosmical scatter" than the A0-A2V stars from the Bright Stars Catalogue (Mendoza 1985).

2) The Hyades stars fall in three regions (a) on the A0-G2 main sequence (standard relation-ship), (b) on the Am-domain (below the standard relation-ship -Mendoza 1976b), and (c) on the An locus (slightly above the standard relation-ship -Mendoza 1985).

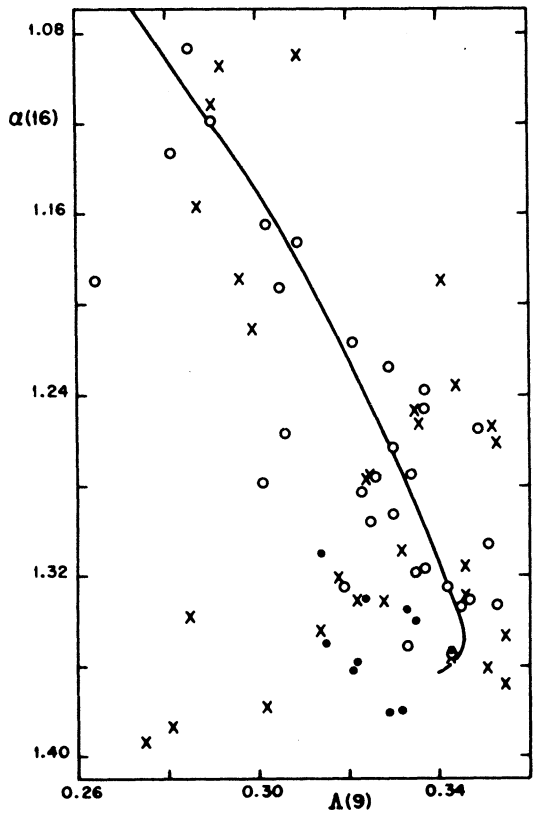

FIG. 1. The (16) (9)-diagram for the Hyades (open circles), Coma Berenices (crosses), and the A0-A2 stars of the Pleiades (dots). The solid line represents the normal main sequence stars from A0 to G2.

3) The Coma Berenices stars occupy five different regions in the α(16)Λ(9)-diagram (a) on the standard **relationship** (b), (c), (d) on the Am, An and Ap domains, respectively, and (3) the locus for luminosity classes III and IV. The Ap stars in Coma fall in the region where the chromium group lies (Mendoza 1977, 1985).

The following **should also** be pointed out:

θ^1 Tau (K0 III) falls below of the standard **relationship** of the A0-G2 V stars, but separated from Am and Ap stars which also are well separated among themselves. There is not a clear separation between A-Vn stars and A-IV stars, in several cases. The mild Am (Am:), and the Am and An stars with very strong Hα-line lie closer to the A0-G2 normal main sequence. These "abnormal" stars probably contribute to enlarge the "cosmical scatter".

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