1960) were adopted from the Catalogue of Bright Galaxies (A. and G. de Vaucouleurs, 1964), and since this system could only be used to classify galaxies with a distinguishable spiral structure, the set of galaxies, treated in this paper, is basically a set of the brightest galaxies in the catalogue. This selection could have had a certain influence on the homogeneity of the data and could have affected the results systematically. This problem was not discussed in the paper.

According to the latest determination of the constant H its most probable value is $H \approx 50$ (km/s.Mpc) (Abell, 1972; Sandage et al., 1972). The disagreement with the value of H, determined here, can be explained by the fact that the methods of determining the distances of galaxies in this paper are based on other, older calibrations. However, these calibrations had to be used, because the authors of the papers, analysed in the present paper, used them as well.

In order to be able to draw a definite conclusion about the dynamic properties of the system of galaxies of a higher order, i.e. supergalaxies, it is necessary, first of all, to know the distance of very many more galaxies and to gain a more profound knowledge of the dynamics of clusters and clouds of galaxies.

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ON THE EQUIVALENT WIDTH OF CH LINE IN ETA AQUILAE

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Equivalent widths of a line belonging to the 0—0 bands of the electronic transition $^2\Delta - ^2\Pi$ of the CH molecule have been calculated for various phases of light variation in η Aql. For the spectral class of η Aql the equivalent widths are found to be rather small.

Об эквивалентной ширине линии CH b η Aql

Для разных фаз изменения блеска η Aql была вычислена эквивалентная ширина линии относящейся к 0—0 полосе электронного перехода $^2\Delta - ^2\Pi$ молекулы CH. Найдено, что для спектрального класса η Aql эквивалентные ширины несколько меньше.

Introduction

Based on Dawe's (1968) preliminary model atmospheres of η Aql, the dissociation equilibrium of various molecules was considered earlier (Pande et al., 1972) and then the possibility of observing the molecular lines belonging to the species CO, CO^+ and C_2 was discussed by our group (Pande and Joshi, 1973; Bondal et al., 1973).

In this paper we consider a line belonging to the CH molecule at wavelength 4313·662 A pertaining to the 0—0 band of the electronic transition $^2\Delta - ^2\Pi$

and branch Q_{1c}, in the spectrum of η Aql. The equivalent width of this line as observed in the solar photospheric spectrum is 62 mA (Laborde, 1961). The method adopted for calculating the equivalent widths of this line at various phases of light variation in the star is the same as given earlier by Gaur et al. (1971).

Calculations

For the line of CH under consideration, the run of $p(\mathrm{CH})/p(\mathrm{H})$, where the p's denote partial pressures of the species indicated in brackets, has been taken from Pande et al. (1972). The quantities Q_{int}, $f_{\mathrm{el}} \cdot f_{0-0} = 4{\cdot}5 \times 10^{-4}$ and S_J were taken from Tatum (1966), Schadee (1964) and Laborde (1961) respectively. The other assumptions are the same as enumerated by Pande and Joshi (1973).

Discussions

The resulting equivalent widths W, of the selected line of CH (at various phases) are tabulated below (Table I).

Table I

Phase	Equivalent Width W (mA)
0·68	20
0·55 & 0·75	16
0·35 & 0·85	7
0·15 & 0·90	4
0·00	1 (nearly)

Unfortunately, we do not have any spectrum of η Aql available with us. So, a direct comparison of the calculated equivalent widths with the actual observations is not possible at present. The only possible alternative is to compare the observations of δ Cep analysed by Walraven (1948) with the theoretical results obtained by us for the 4313.662 A line of CH in the spectrum of η Aql. Walraven (1948) has derived an average Doppler width and damping constant by comparing his observational curve of growth with the theoretical curve of Unsold (1938). We tried to match Walraven's (1948) observational curve of growth for δ Cep with that of Unsold's (1938) but failed to get a good fit. The equivalent widths for the CH line in question turned out to be unreasonably large. The system of units adopted by Walraven (1948) is also not very clear. We assume that the considered CH line may be a weak line in as much as the equivalent width in the solar photospheric spectrum is 62 mA. The Doppler asymptote given by Walraven (1948) leads to the values of 27 mA and 102 mA for the equivalent widths at maximum and minimum phases of light variation in δ Cep. The spectral classes of this star at maximum and minimum phases are F5Ib and G2Ib respectively. For η Aql the corresponding spectral classes are F6Ib and G4Ib respectively (Melnikov, 1962). Obviously, the molecular lines should be strengthened in η Aql as compared with δ Cep as the former star appears to belong to later spectral classes at all phases.

The small predicted equivalent widths of the 4313.662 A line of CH in η Aql spectrum may be explained either by the uncertainties in the carbon abundance or in Dawe's (1968) models. Larger carbon abundance than the solar and/or models cooler than Dawe's (1968) in the region where the selected CH line originates can lead to a variation in equivalent width with phase compatible with the spectral class variation in η Aql.

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