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A Low-Dispersion Luminosity Indicator for Solar-Type Dwarfs. DON C. BARRY, *Astronomy Department, University of Southern California.*—The ratio of the 3859- and 3871-Å features in the 117-Å/mm grating spectra of late F and early G dwarfs is very sensitive to luminosity. The sensitivity is sufficient to justify the use of classifications Vb, Vab, and Va.

A plot of the 3859 Å/3871 Å ratio versus the Strömgren luminosity indicator Δc_1 for 39 stars reveals a good correlation. However, there is a tendency for the stars with weak metallic lines to have systematically low Δc_1 indices for a given luminosity (3859 Å/3871 Å ratio) while stars with strong metallic lines have systematically high Δc_1 indices for the same luminosity (3859 Å/3871 Å ratio). This suggests that the c_1 index is biased by differences in metallic-line strength. Application of Strömgren's correction to c_1 for its dependence on line strength produces an improved correlation between 3859 Å/3871 Å and corrected Δc_1^*. However, there still remains a slight tendency for stars with weak metallic lines to have low Δc_1 indices for a given 3859 Å/3871 Å ratio.

Analysis of the 3859- and 3871-Å features in the solar spectrum indicates that approximately 70% of the equivalent width of λ3859 Å is due to neutral metals (mostly Fe I) and 30% is due to CN, while 40% of the equivalent width of λ3871 Å is due to neutral metals (mostly Fe I) and 60% is due to CN plus some CH. Thus the remaining slight tendency for weak-line stars to have lower Δc_1 indices should rather be interpreted as a slight tendency for weak-line stars to have lower than normal 3859 Å/3871 Å ratios for their luminosity.

Although the ratio is slightly biased by differences in the strength of the metallic lines, this effect is not nearly as serious as the bias on the c_1 index. Values of the ratio of 2/1, 3/2, 1/1, and 2/3 indicate luminosity class Vb, Vab, Va, and IV, respectively. The luminosity class of the sun determined from this ratio is Vab.

Preliminary Classification of Clusters of Galaxies. LAURA P. BAUTZ, *Dearborn Observatory,* AND W. W. MORGAN, *Yerkes Observatory.*—Classification into four categories of clusters in Abell's catalogue has been carried out from the point of view of the nature of the brightest member galaxies.

Categories are:

- I clusters containing a centrally located cD galaxy;
- II clusters whose brightest members are intermediate between cD galaxies and Virgo-type ellipticals;
- III clusters containing no outstanding galaxies; this category is divided into two subgroups: IIIE or IIIS depending on the absence or presence of giant spirals among the brighter members;
- IV clusters whose brightest members are predominantly spirals.

Classification was done for the Abell clusters of distance class three and less on the Dearborn Observatory copy of the National Geographic Society–Palomar Observatory Sky Survey.

Preliminary results indicate that there are very few rich clusters of type IV. A277 can be considered to define this category and, at present, is the only known member; the Ursa Major Cloud (not a rich cluster) is of class IV.

Ca II *K*-Line Formation in a Two-Component Solar Atmosphere. HERBERT A. BEEBE, *Department of Astronomy, New Mexico State University, Las Cruces, N. M.*—The problem of the formation of the Ca II *K*-line core is attacked under the assumption of a two-component chromosphere. Many model solar atmospheres are tested by comparing observed and calculated average intensity profiles at several places on the solar disk. The non-LTE line profile calculations are made under the assumption of complete redistribution of photons in the line, using model atoms of two and three bound levels while varying the value and depth of the temperature minimum and turbulent velocity gradient. The method of calculating the non-LTE source function and center-to-limb intensities is described by Beebe and Johnson (1969, *Solar Phys.* **10,** 79).

The optimum "cell" component, covering 90% of the solar surface, is found to have a temperature minimum of 4200°K at 700 km above the photosphere and turbulent velocities of about 1 km/sec up to a height of 1500 km. The low cell velocities, topped by a sharp gradient to 12 km/sec thus increasing the photon capture probability, is found to have a strong influence on the K3 feature. The preferred "wall" model, covering about 10% of the surface is found to be never more than 500°K hotter than the cell model with a chromospheric rise beginning at 500 km and a turbulent velocity gradient rising from 1 to 5 km/sec beginning at 700 km.

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