ULTRAVIOLET CLASSIFICATION FROM THE S2/68 EXPERIMENT ON BOARD THE TDIA SATELLITE

A. Cucchiaro

Institut D'Astrophysicques de Liege

A morphology analysis as well as a statistical study of the spectra provided by the S2/68 experiment is made in order to establish ultraviolet criteria of classification. These criteria, either line features or intensity ratios, permit the establishment of a two-dimensional classification to be made from the so-called B0 to G0 type star in the classic range. This classification scheme permits also "abnormal" spectra to be singled out, thanks to the definition of the "normal" spectra.

A more detailed analysis on "abnormal spectra" (WN and WC stars, Bp stars, Ap stars, λ B00 stars...) has been considered.

https://doi.org/10.1017/S0252921100104348 Published online by Cambridge University Press

DISCUSSION

Gerbaldi: Is the feature 2360 Å for the Am stars sensitive to a luminosity effect?

Cucchiaro: Until now I have detected no luminosity effect at 2360 Å.

Gratton: Have you checked your criteria to see whether there is some interstellar absorption effect?

Cucchiaro: Concerning the influence of interstellar absorption, the spectra of the initial sample correspond to bright stars, therefore, they should be essentially unreddened. In addition stars with an E(B-V) > 0.06 have not been considered, except for a few supergiants, in order to increase the number of these kinds of stars and thus to permit a statistical study.

Gratton: Are there any variable stars in your sample?

Cucchiaro: In our sample, we have avoided as much as possible the variable stars.

Cowley: It is interesting to consider possible reasons for some of the A stars that cannot be fitted into the classification scheme developed thus far. The reason, perhaps, is that the abundances of iron peak elements are varying with respect to one another. For example, in 53 Tau, a manganese star, the iron abundance is either solar, or below solar, while the manganese itself is overabundant, of course. On the other hand in HR 7664, another manganese star, the iron abundance is surely greater than in the Sun. Thus any ratio of features which is sensitive to the Mn/Fe ratio is going to give trouble. Similar remarks could be made for the so-called Cr-Eu stars, and even for the so-called normal stars.

Cucchiaro: Yes, I completely agree with you, but what I mean by a homogeneous group of spectra related to the group known in the visual as Hg-Mn stars is that between the Mn stars of the initial sample only about 10% have escaped from this group. This is also applicable for the other groups of "abnormal" spectra.

Andrillat: Have you observed Wolf-Rayet stars which are nuclei of planetary nebulae?

Cucchiaro: Yes, we have observed Wolf-Rayet stars which are nuclei of planetary nebulae but I have not introduced an example in our atlas because their study is in progress in Liege.

https://doi.org/10.1017/S0252921100104348 Published online by Cambridge University Press

Viotti: The dominant feature in the UV spectrum of intermediate type stars is the short wavelength cut off, whose position is strongly temperature dependent. But the energy flux at the cut off is also a function of the atmospheric structure. It would, in particular, affect the ionization equilibrium in a shell or extended envelope. For example Dr. J. Smolinsky found in the shell spectrum of the luminous G star HR 8752 the absence of shell lines of the singly ionized elements with first ionization potential larger than about 6.5eV, and the presence of ionized lines with slightly lower ionization potential. This could be related to a sharp cut off of the UV flux of the star near 1800-1900 Å, not to any kind of electron distribution. Hence the observation of this spectral region with IUE and of time variations will help the study of line excitation in the envelopes of intermediate type stars.

Cucchiaro: Yes, it is the main reason for the establishment of our Atlas.

Houziaux: What accuracy do you obtain for the "r" factors?

Cucchiaro: The accuracy we obtain for the "r" and "Cp" factors depends both on the agreement between the different spectra of the same star and on the statistical fluctuations in the number of photons counted in each channel of the experiment. Taking into account the two sources of errors we arrive at a mean value of ±0.8 of a spectral subclass and one luminosity class.

https://doi.org/10.1017/S0252921100104348 Published online by Cambridge University Press