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THE PHYSICAL BASIS OF THE SPECTRAL CLASSIFICATION OF A, F AND G STARS

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We present the first results of a precise scheme for spectral classification for the late B, A, F and early G-type stars. We have used ∼15000 well classified stars from (Hauck & Mermilliod 1998) and with the Strömgren $(b-y)$, $[c_1]$ and $[m_1]$ indices (Strömgren 1951) to define the regions in the $[m_1]$-$[c_1]$ diagram. We also generate calibrations for the effective temperature ($T_{\rm eff}$) and the surface gravity.

For this work we have taken data from (Hauck & Mermilliod 1998) which contains ∼63000 stars. We have locked for spectral type on SIMBAD and our final list with well definend spectral types and photometric measurements contains ∼15000 stars. We corrected for galactic extinction as (Crawford 1975) and (Strömgren 1966).

To get the physical parameters we have used CHORIZOS (Maíz-Apellániz 2004), a Chi-square cOde for parameterRized modeling and characterIZation of phOtometry and Spectrophotometry to obtain the $T_{\rm eff}$ and the surface gravity. This code compares photometryc data with model spectra energy distributions. The code calculates the likelihood for the full specified parameter ranges, thus allowing for the identification of multiple solutions for the derived parameters of a single solution.

In Figure 1 we can see the histograms of m_1 color for each F3V and F5V stars as an example, we have taken the mean values of the Strömgren colours to use it in CHORIZOS to get the $T_{\rm eff}$.

In Figure 2 we present our preliminary results of this calibration of the MK system for B7-G5 main sequence stars in therms of the $(b-y)$ vs. $T_{\rm eff}$. We can see the trend of the $T_{\rm eff}$ to increase from G type stars to B type. We also have shown the effectiness of the Strömgren system in the investigation of the plysical properties of the stars. We will be applying this system to open clusters, globular clusters and galaxies in clusters. To complete this work we are doing an exhaustive correction for the extinction of the $(b-y)$ color.

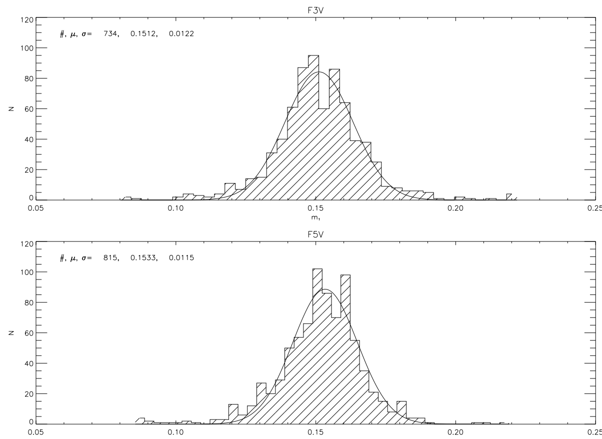

Fig. 1. Examples of the mean values of the index $[m_1]$ for stars of F3V and F5V spectral types.

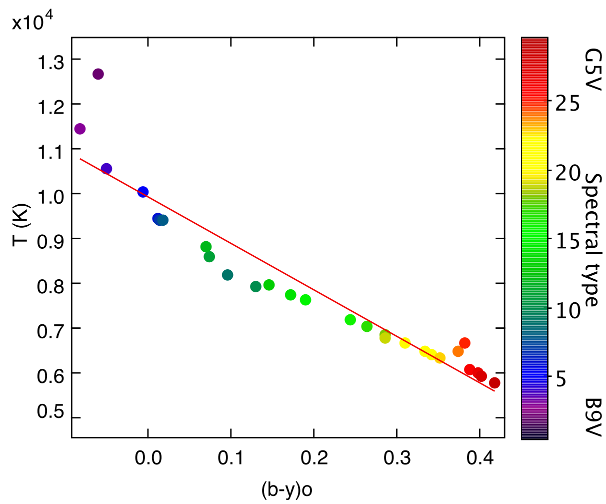

Fig. 2. This figure shows the dependence of the spectral type $(b-y)_0$ with the derived $T_{\rm eff}$.

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