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SPECTROSCOPIC STUDY IN THE N 159/N 160 STAR FORMING REGION

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Introduction. We performed a spectroscopic study to characterize the evolutionary state of the stellar population in the N159/N160 Complex (in the LMC) with the aim of understanding the possible star formation scenario that has been taking place there. N159/N160 extends at the southern edge of 30 Dor (approx. 600 pc) and conforms a massive star formation region, in which it is possible to resolve individual stars while still appreciate the large scale structure of the whole region.

Observations and data reduction. Spectra were obtained in November 2003, at LCO (Chile), using the 2.5 m telescope in multi-object spectroscopy mode. The grism used gives 1.3 Å/pix dispersion, yielding a resolution of 0.77 arcsec/pix over a 25 arcmin field of view. Nine different masks were used to obtain a total of 240 stellar spectra.

Results. Approximately 200 stars were classified, most of them are OB stars with no previous classification ever published. Spectra were classified mainly following the criteria by Walborn & Fitzpatrick (1990), and several bibliograph sources were consulted for later types and less ordinary spectra. Our attention was focused on the study of categories of broad range of spectral types rather than on individual objects, but a great number of interesting objects by themselves were found in the sample, namely a Be star (similar to η Carinae, c.f. atlas of Walborn & Fitzpatrick 2000), a O3 V((f*)) star (Walborn 1971; Walborn et al. 2002), more than six members of Onfp family (Walborn 1973; Conti & Leep 1974), an O9.7 Iabpe star (which has stellar Hα emission), etc.

Analysis: Global distribution. The evolutionary scenario on the large scale is in good agreement with results of previous studies made in CO (Yamaguchi et al. 2001; Bolatto et al. 2000), which suggest that the northern part of the complex (N160) is in a higher stage of evolution than the southern part (159S). In Figure 1 it can be seen that there is a larger proportion of more evolved SOB1 stars in the northern part of the complex (that is closer to 30 Dor) than in the southern part. However, it can also be observed that there is no clear distribution of the stars in phases pointing to consecutive episodes of star bursts but a mixture of them. There is evidence towards the presence of two scales of star formation coexisting; on a large scale there seems to be a kind of evolution progression from north to south while on a minor scale, stars are still forming in smaller groups all over the complex.

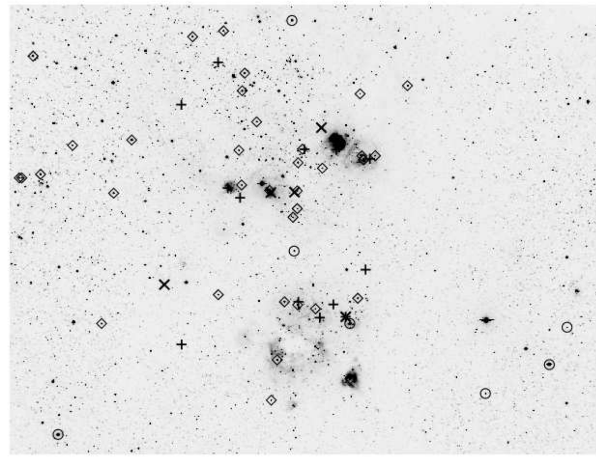

Fig. 1. Spatial distribution of stars according to their evolutionary state. North is up, east on left. The phases of massive OB cluster evolution defined by Walborn et al. (1997) and used here are: Orion Nebula, predominant ZAMS O stars (< 1 Myrs.), plus symbols; Carina Nebula, early O V ($\sim$ 3 Myrs.), crosses; Scorpius OB1, late O V and early B I ($\sim$ 5 Myrs.), diamond symbols and hχPersei; mid-B/A/M I ($\sim$ 8 Myrs.), circles.

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