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The complex NGC 1962-65-66-70 is one of the many giant filamentary shell nebulae in the LMC. The nebulosity, also known as N144 was studied originally in H-alpha by Henize (1956). It has an angular size of 698" x 620" and surrounds an association of very young blue stars. The cluster has been studied first photographically in V and B by Westerlund (1961).

We have observed the brightest members of the association with the IUE satellite and obtained both low and high resolution spectra in the ultraviolet region. Some results on these UV observations, especially concerning the stellar energy distribution of HD 269546, as well as our studies of the hot galactic coronal gas have been published earlier (Grewing and Schulz-Lüpertz, 1980, Schulz-Lüpertz and Grewing, 1982). Here we present results of direct photography, photometry, and spectroscopy. The observations have been carried out at the European Southern Observatory, La Silla, Chile. The UBV magnitudes of 68 stars in the field of NGC 1962-65-66-70 have been measured. The association contains a few very luminous evolved supergiants, but most of the stars belong to the upper main sequence of the cluster. Some galactic foreground stars can clearly be separated by making use of the two-colour diagram. From this diagram we also derive a total interstellar reddening of  $E(B-V) = 0.10 \pm 0.01$  for the LMC members in our sample.

All observed supergiants in the cluster have composite spectra, and both our optical and IUE spectrograms show strong emission features for most of these stars indicating mass loss by stellar wind. A more detailed investigation of these evolved stars on the basis of high resolution spectra from different wavelength bands is currently under way. Also the stars at the upper end of the main sequence show clearly Of emission characteristics. From our optical low resolution spectra we could derive the spectral types of some of these stars. We find a mean spectral type of O8(f) for the main sequence turnup region.

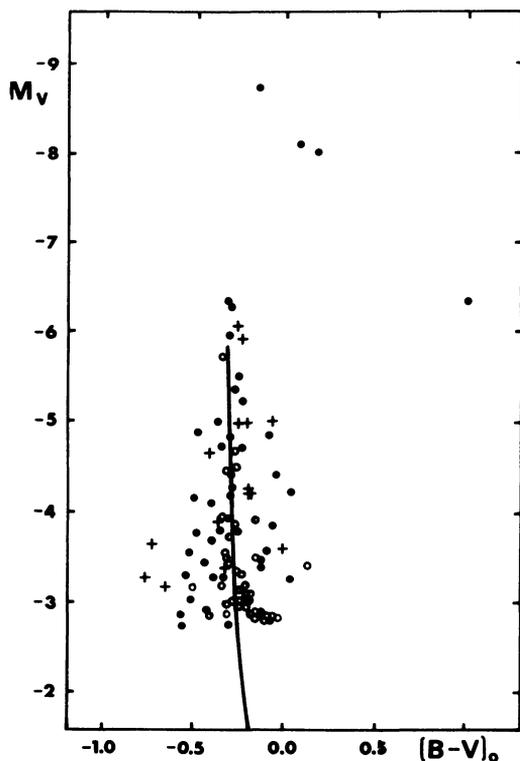


Fig. 1: Observed colour-magnitude diagram of the bright stars in NGC 1962-65-66-70.  
 ● : cluster members observed in the present investigation;  
 ○ : additional cluster members measured by Westerlund (1961);  
 + : possible LMC field stars.  
 The curved line represents the mean colour-magnitude relation for luminosity class V (Schmidt-Kaler, 1982).

By combining our spectroscopic and photometric data and converting them into physical parameters we are able to construct the observed H-R diagram of the cluster. This is reproduced in Fig. 1. If we compare these data with theoretical model calculations for stellar evolution which consider the mass loss effects in the most massive stars (e.g. Maeder 1981) we find an age of 3.5 - 4 million years for NGC 1962-65-66-70.

A more detailed paper on these investigations will be published elsewhere (Schulz-Lüpertz and Grewing, 1983).

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