

ABUNDANCE PATTERN OF SUPERGIANTS IN THE FIELD OF THE SMALL MAGELLANIC CLOUD AND IN THE CLUSTER NGC330

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NGC330 (the brightest SMC young cluster, with an age of ~ 20 -25 Myrs) contains many bright red and blue supergiants. This cluster has arisen special interest, since the earlier abundance determinations were indicating an abundance lower by a factor ~ 5 than in the SMC field young population. How could a young cluster form with a metallicity lower than that of the surrounding field? Moreover, in the SMC, the young field population seems to be fairly well mixed (small abundance scatter among H II regions and young stars). Taking advantage of our previous high resolution analysis of a sample of in the SMC field type K supergiants (Paper I and II), we analyse 6 cool supergiants in NGC330, in order to compare in an homogeneous way, the metallicity and abundance ratios of various elements in NGC330 and in the field of the SMC. The main results may be summarised as follows:

- the deficiency of NGC330 is found to be of $[\text{Fe}/\text{H}] = -0.82 \pm 0.11$ dex (mean and *rms* for 6 stars) whereas the field stars had a $[\text{Fe}/\text{H}] = -0.69 \pm 0.10$ dex (mean and *rms* for 6 stars). A slight difference may exist between the field and the cluster stars, but this difference is small.
- the abundance pattern of the ~ 20 elements studied, is similar to that of the field supergiants, except for a few elements: Oxygen's star to star scatter is significantly larger in the cluster; the very heavy neutron capture process elements ($[\text{La}/\text{Fe}], [\text{Eu}/\text{Fe}] \dots$) are less enhanced in the cluster.
- lithium is detected in all stars and is low, indicating that the stars underwent dilution (mean value and *rms* for the 6 stars: $\log N_{\text{Li}}/N_{\text{H}} \simeq -11.4 \pm 0.2$).

References

Hill, V., (1997) *A&A* 324, 435 (Paper I)

Hill, V., Barbuy, B. and Spite, M. (1997) *A&A* 323, 461 (Paper II)