

CaT METALLICITIES OF SMC STAR CLUSTERS: TRACERS OF THE CHEMICAL EVOLUTION

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Abstract / We present new results based on VLT Ca Triplet (CaT) medium resolution spectroscopy of red giant members of 10 SMC intermediate - old age clusters. We derive mean cluster velocities to a few $km\ s^{-1}$ and mean metallicities to 0.05 *dex*. We combine these results with those from 29 additional clusters previously studied, as well as accurate velocities and metallicities for about 750 surrounding field giants, previously studied. This additional sample was observed with the same instrument and instrumental configuration as in the present work, and their metallicities were obtained following the same prescriptions. We investigate the metallicity distribution, age-metallicity relation and metallicity gradient in great detail for the SMC using this large and homogeneous database. We find some surprising differences between the clusters and their fields. In fact, the clusters display a suggestion of bimodality in the metallicity distribution while the field stars are unimodal. The clusters show no strong evidence of a metallicity gradient while the field stars show a strong negative gradient in the inner region of the galaxy that appears to reverse sign in the outer region. The age-metallicity relation of the clusters shows a significant intrinsic metallicity dispersion at all ages, but no satisfactory fit to any current chemical evolution model has been found. We also analyze the cluster chemical properties considering the possible effects produced by the interaction of the SMC with the LMC and the Milky Way. We discuss those results and their implications on the formation and evolution of the SMC.

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