Photometric Results for Stellar Fields Inside Supergiant Shell LMC4

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Abstract. BVR photometry of stellar fields in the NW region of supergiant shell LMC4 has been performed. We present preliminary results on the age of the stellar populations in this part of the LMC.

Key words: Stellar Populations - Magellanic Clouds - Star Formation

Within the framework of the ESO Keyprogam on Coordinated Investigations of Selected Regions in the Magellanic Clouds (de Boer et al. 1989), we took Johnson-Cousins BVR CCD frames of 8 partly overlapping fields in Keyprogram Region E, which is located in the NW part of supershell LMC4 in the Large Magellanic Cloud (LMC). We obtained our data with the ESO-MPIA 2.2m telescope equipped with a Thomson 1024x1024 chip. The frames cover the region from the intermediate-age cluster NGC 1978 to the association NGC 1948.

To determine the age, we compared observational colour-magnitude diagrams (cmds) with theoretical models of stellar evolution. We used two different sets of tracks. One takes the effects of overshoot in a convective core into account (Bertelli et al. 1991) and the other one adopts a classical description of convective mixing in the core (Bencivenni et al. 1990). A nearly instantaneous star formation and a Salpeter IMF are assumed. As distance modulus to the LMC, we adopted 18.5 mag.

With the classical models, we derive 30 Myr as age of the field population, whereas it is 70 Myr when overshoot is considered. The ratio of main sequence to evolved stars (an indicator of the star formation history) indicates an enhancement of the global LMC star formation rate about 4 Gyr ago, which is compatible with the results of Mateo et al. (1990) and Bertelli et al. (1991) for other LMC fields.

The age of the association NGC 1948 is about 6 Myr from classical models or 20 Myr with overshoot. If this association is a result of self-propagating star formation, induced less than 15 Myr ago due to the shock wave from the supershell (Dopita et al. 1985), overshoot models predict a slightly too large age. On the other hand, the ages we derived are consistent with star formation progression in the LMC4 region derived by Reid et al. (1987).

For the globular cluster NGC 1978 we have only a preliminary age estimate of more than 2 Gyr, when compared with isochrones of Bertelli et al. (1991) and assuming $Z = 0.004$.

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