METAL ABUNDANCES OF MAGELLANIC CLOUD CLUSTERS

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ABSTRACT. High signal-to-noise ratio, medium resolution spectra have been obtained for ~8 giants in each of 18 LMC clusters with the CTIO 4-m multifiber ARGUS spectrograph. In addition, Washington CCD photometry has been obtained for ~50 SMC and LMC clusters with the CTIO 4-m and 1.5-m from which abundances can be obtained for ~25 giants per cluster. The derivation of metal abundances from these data will be discussed and some preliminary results presented.

1. Introduction

Magellanic Cloud clusters offer a unique opportunity to study chemical abundances in two galaxies whose chemical evolution and cluster formation histories are clearly different from that in our own Galaxy, as well as from each other. Unfortunately, good abundance determinations are still lacking for many MC clusters despite their crucial role in age-metallicity and distance calibrations. We have begun a large-scale program to determine abundances for many giants in each of a large sample of clusters using a variety of photometric and spectroscopic techniques.

2. Data

The CTIO 4-m ARGUS multi-object fiber-fed spectrograph is ideally suited to studying the composition of many MC cluster giants simultaneously. We have obtained data for 18 LMC clusters. The spectra range from ~4800 - 6400 Å, with a resolution of ~6 Å, and are of excellent signal/noise ratio. The strong absorption lines due to Mg, Fe and Na will be used to measure metal abundance, as outlined in Faber et al. (1985, ApJ Suppl., 57, 711). This method shows good abundance discrimination in most metallicity regimes. However, there does seem to be some confusion between intermediate-metallicity giants. Washington CCD photometry has been shown to be a useful technique for investigating metal-abundances of a large number of giants in MC clusters (Geisler 1987 AJ, 93, 1081). We have now obtained Washington CCD observations for a total of 16 SMC and 34 LMC clusters. Results indicate that abundances can be determined for a large number of giants (typically ~25) per cluster.

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