

## THE HI MOSAIC OF THE LARGE MAGELLANIC CLOUD

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### ABSTRACT

We present the recent results of an HI aperture synthesis mosaic of the Large Magellanic Cloud(LMC), made by combining data from 1344 separate pointing centers using the Australia Telescope Compact Array(ATCA). The resolution of the mosaiced images is  $1'.0$  (15 pc, using a distance to the LMC of 50 kpc). In contrast with its appearance at other wavelengths, the LMC is remarkably symmetric in HI on the largest scales, with the bulk of the HI residing in a disk of diameter 7.3 kpc. Outer spiral structure is clearly seen, though the features appear due to differential rotation, therefore transient in nature. A good correlation is seen between the supershells previously identified in *Halpa* (e.g. Meaburn 1980) and HI structures.

*Key Words* : Large Magellanic Cloud - interstellar:HI, H $\alpha$  - radio lines:atomic

### I. INTRODUCTION

The LMC is the nearest internally bound galaxy to the Milky Way, and is an important laboratory for the study of gas dynamics and star formation in young galaxies. Previous HI observations(e.g. Luks & Rohlfs 1992) have been limited by the spatial resolution of the Parkes telescope at 21 cm(220 pc at the distance of the LMC). However, the Australia Telescope Compact Array(ATCA) permits much higher spatial resolution to be obtained. In this paper, we describe the very first results of a new survey.

### II. OBSERVATIONS

The Large Magellanic Cloud has been surveyed in the neutral hydrogen emission with the Compact Array. The mosaic consists of 1344 separate pointings of the 750-m array(4 configurations) covering a field of  $10^\circ \times 12^\circ$  with an angular resolution of  $60''$ ( $\sim 15$  pc) and a velocity resolution of  $1.6 \text{ km s}^{-1}$ . The images (see Figure 1) show the detailed spatial structure of the neutral interstellar gas in the LMC for the first time. On the small to the medium scales, the combined action of numerous shells and supershells dominate the structures and motions of the HI in the LMC. On large scales, the LMC is remarkably symmetric in the appearance, compared with other wavelengths and shows a pronounced spiral pattern confirming the results of Meaburn and others. A southern spiral arm is seen for the first time. This arm extends out from the 'B3' stub tentatively identified by de Vaucouleurs and Freeman(1972).

### REFERENCES

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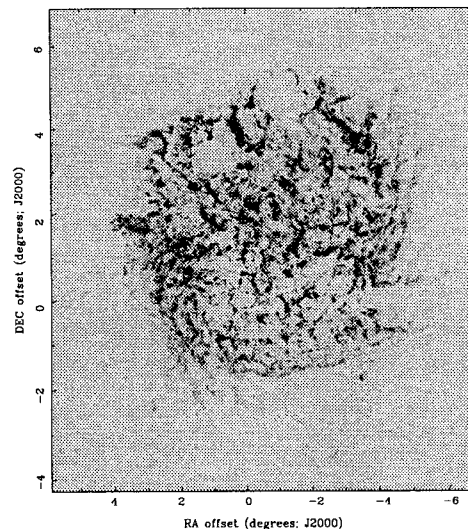


Fig. 1.— The peak 21-cm brightness temperature map(measured at each channel) from the ATCA survey of HI in the LMC. The channel width is  $1.649 \text{ km s}^{-1}$ . The highest brightness temperature in this map is 109K.

