

A NEW 4m MILLIMETER-WAVE TELESCOPE FOR A SOUTHERN SKY CO SURVEY

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ABSTRACT. We plan to install a new 4m radiotelescope in Australia to complete a sky survey of star-forming regions in the millimeter-wave CO(J=1-0, J-2-1) emission.

1. Observations

Since 1985 we have been conducting an unbiased survey of star-forming regions in Orion, Monoceros, Taurus Ophiuchus and Cepheus, with the 4m radiotelescope at Nagoya University (latitude +35°). We are now using a 4K Nb SIS mixer with $T_{\text{rec}}(\text{DSB}) = 23 \pm 2$ K and $T_{\text{sys}}(\text{SSB}) \sim 150$ K (Ogawa *et al.* 1990). A small telescope with such a low noise receiver enables us to observe a large area of several tens of square degrees within a reasonable time, i.e. a few months.

So far our survey has resulted in the discovery of 52 molecular outflows (Fukui 1989) and numerous molecular cloud cores, suggesting that many unknown young objects are still to be detected. However, about one third of the sky cannot be observed from Nagoya. So, to complete the whole sky survey with the same beamsize (~3' arc) we plan to build a new 4m telescope in Australia. This will let us extend our survey to the many unique galactic and extragalactic objects not accessible from Nagoya, e.g. the Magellanic Clouds, Carina Nebula, Chamaeleon I and the Gum Nebula which contain many bright-rimmed globules, and should stimulate further observations using existing, large southern radio and optical telescopes.

The new telescope has a new 4 K, Nb SIS-array receiver, better surface accuracy provided by CFRP (Carbon Fibre Reinforced Plastic), a higher driving capacity, and portability. It is under construction at Nagoya University (Figs 1 and 2), and will be used for molecular line observations in Japan (winter 1990 to spring 1993) before going to Australia for the southern sky survey.

2. References

- Ogawa, H., Mizuno, A., Hoko, H., Ishikawa, H., Fukui, Y (1990), *Int. J. Infrared Millimeter Waves* in press.
Fukui, Y. (1989), *Low Mass Star Formation and Pre-Main Sequence Objects*, B. Reipurth (ed.) (ESO: Garching) p. 141.

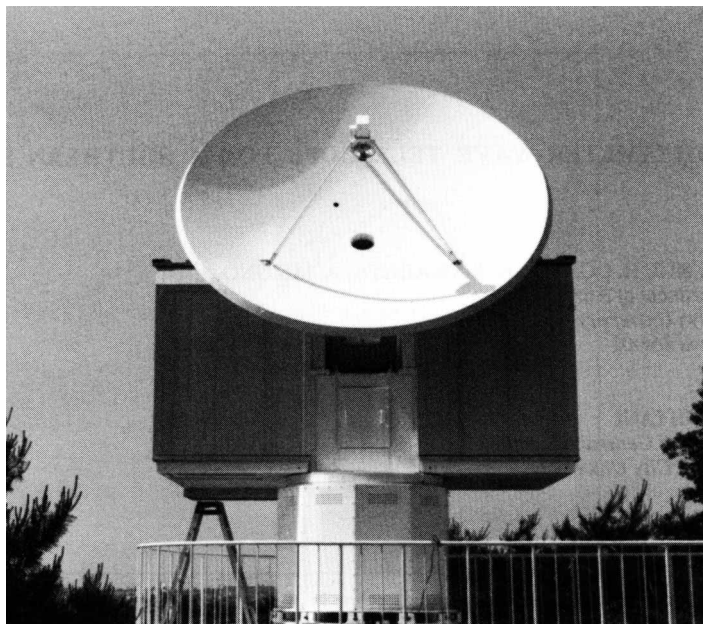


Figure 1. A new 4m millimeter-wave telescope being constructed at the Nagoya University.



Figure 2. The new (back, left) and the old (front, right) 4m telescopes at the Nagoya University.