# REPORT ON A SURVEY OF $H_2O$ MASERS TOWARDS THE GALACTIC CENTER

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## 1. Introduction

Galactic $H_2O$ masers are associated either with the circumstellar shells of late-type stars or with star-forming regions (SFRs). Previous surveys for $H_2O$ masers had revealed relatively few near the Galactic Center (GC). We report on the continuation of a survey using the VLA to make 22.2 GHz observations of IRAS point sources which lie within 2° of the GC and which have either 12 $\mu$m or 25 $\mu$m flux > 8 Jy. Taylor, Morris and Schulman (TMS, 1992, *AJ*, 106, 1978) previously observed 97 of 342 candidate sources. We have observed 160 more and plan to complete the survey in early 1995.

## 2. Results

54 new masers in the direction of the GC have been detected. The resulting sample contains both SFRs and circumstellar masers, which are distinguished by IR colors and by 22 GHz spectra. We have adopted the color criterion of TMS, which was validated by comparison to independent identifications. The survey sample also contains both masers located in the GC and relatively local masers lying along the line of sight to the GC. These two populations are distinguished by assuming that high-velocity (>30 km/s) sources in the direction of the GC are participating in the high



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velocity dispersion of the inner galaxy. The populations overlap at 0 km/s. 19 of the detected masers are in the high-velocity population.

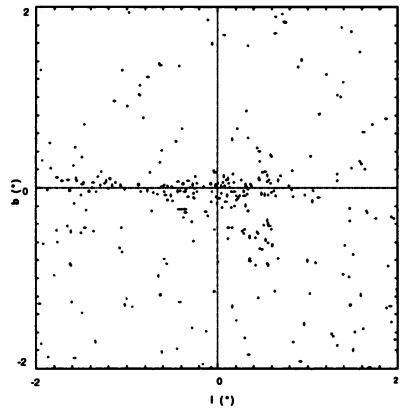

Figure 1–Distribution of IRAS Candidates

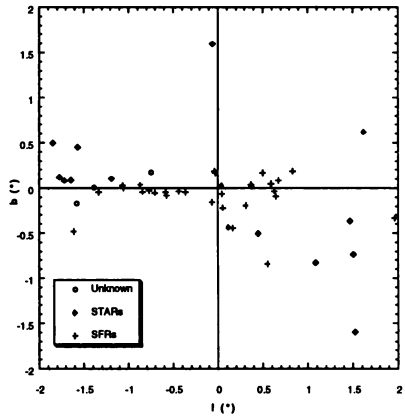


Figure 2–Distribution of Masers

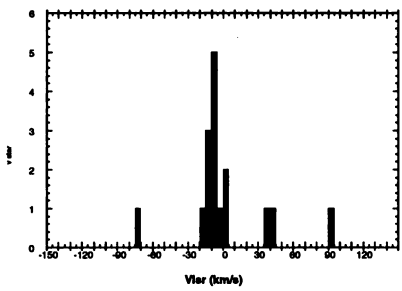

Figure 3–Velocity histogram for Circumstellar Masers

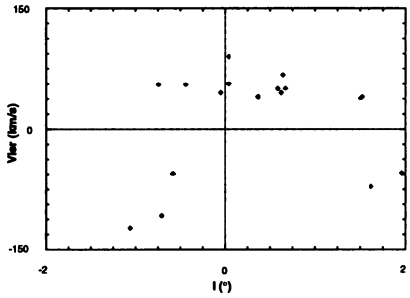

Figure 4–Longitude vs velocity for high-velocity masers

## 3. Conclusions

We note that there appears to be an offset in the peak of the circumstellar velocity histogram from 0 km/s, of about -13 km/s. Deguchi (1995, *these proceedings*) noted a similar offset in the Nobeyama SiO maser survey. This may represent motion of the local standard of rest, which would be a useful and sensitive diagnostic of Milky Way bar geometry (Weinberg, 1995, *these proceedings*).

If we continue with a similar detection rate for the remainder of the survey, we will have a final sample of 75 $H_2O$ masers in the survey region, ~32 of which are expected to be GC sources.

The resulting sample will provide valuable information about the mass distribution at the GC, GC star formation, $H_2O$ maser luminosity functions, molecular cloud velocity dispersion, motion of the LSR and bulk motion of the material along the line-of-sight to the GC.

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