MOLECULAR CLOUDS IN THE GALACTIC NUCLEUS

R.J. Cohen and W.R.F. Dent
University of Manchester,
Nuffield Radio Astronomy Laboratories, Jodrell Bank,
Macclesfield, Cheshire, SK11 9DL England

The galactic nucleus contains the largest concentration of dense molecular clouds in the Galaxy. A new survey of the region has been carried out recently at Jodrell Bank in the 1667 and 1665 MHz lines of OH (Cohen 1981). The OH lines appear primarily in absorption against the galactic continuum background. The survey reveals many new clouds within the previously known nuclear concentration, and also a more extensive outer distribution of clouds extending to projected distances of ±1 kpc from the centre. The outer part of the distribution is tilted with respect to the galactic plane, reaching z-distances of -200 pc at positive longitudes and +200 pc at negative longitudes. The same tilt or warp has been seen in the high-velocity HI "nuclear disk".

The molecular clouds have complex noncircular motions. We have used the axisymmetric velocity model by Burton and Liszt (1978) to locate the clouds in the nucleus according to their radial velocities. Figure 1 shows the results. Molecular clouds at all z-distances have been projected onto the galactic plane and summed. Thus Figure 1 shows the nucleus as it would appear to an observer located outside the Galaxy, above the North Galactic Pole. The molecular clouds are strongly concentrated into a bar-like structure. The side of the bar furthest from the Sun shows up weaker in OH, but this may be partly a selection effect due to the location of the clouds relative to the continuum sources against which the OH absorption lines are seen, as discussed by Cohen and Few (1976). A bar in this particular orientation has been suggested to explain the non circular motions of many HI features out to and including the 3 kpc arm (Peters 1975; Liszt and Burton 1980; and references therein). It is remarkably that such a bar can be deduced starting from an axisymmetric velocity field.

We are currently extending the analysis to other velocity fields.

E. Athanassoula (ed.), Internal Kinematics and Dynamics of Galaxies, 47–48.

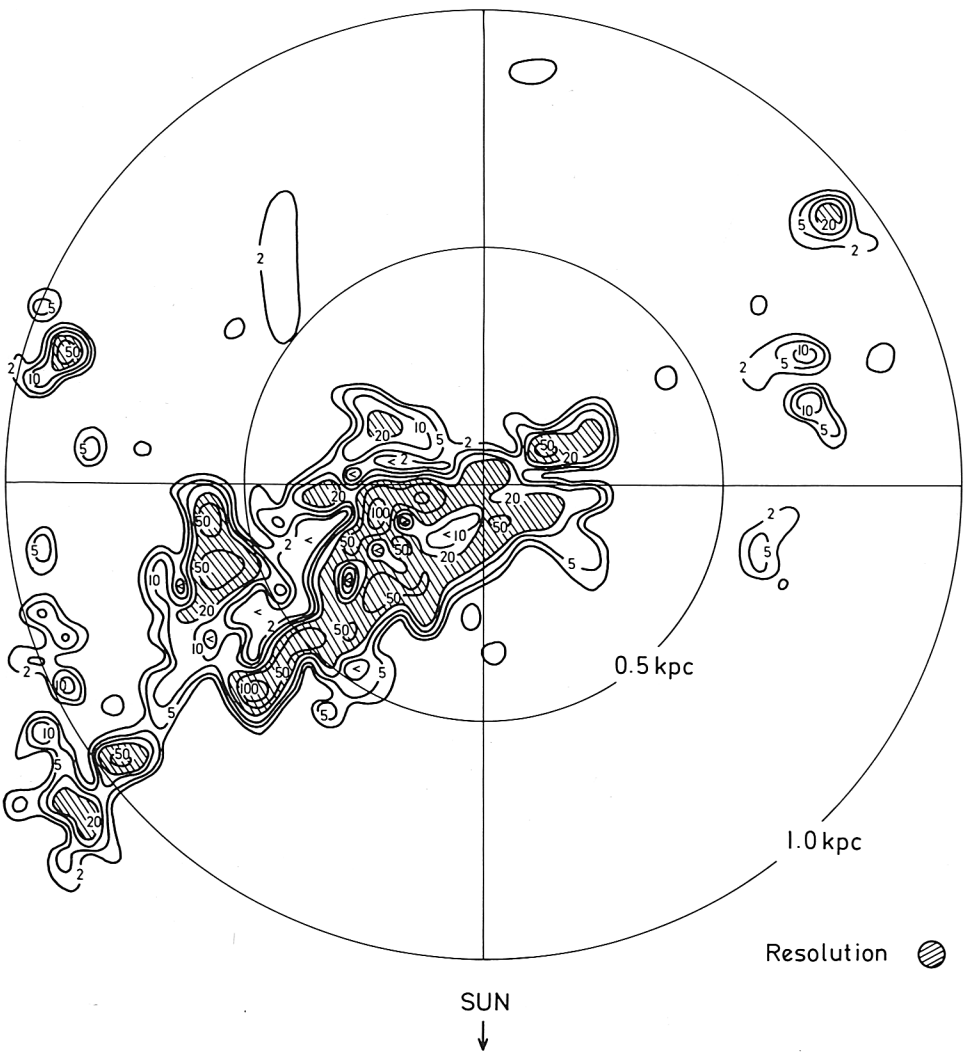

Fig. 1 Distribution of OH in the galactic nucleus, calculated assuming the velocity model by Burton and Liszt (1978). Contours show the apparent surface density of OH, in arbitrary units.

REFERENCES

Burton, W.B. and Liszt, H.S., 1978. Astrophys.J., 225, pp815-842.
Cohen. R.J., 1981. QMC Conference on "Submillimetre Wave Astronomy", eds. J. Beckman and J. Phillips, Cambridge University Press, in press.
Cohen, R.J. and Few, R.W., 1976. Mon.Not.R.astr.Soc., 176, pp.495-523.
Liszt, H.S. and Burton, W.B., 1980. Astrophys.J., 236, pp.779-797.
Peters, W.L., 1975. Astrophys.J., 195, pp.617-629.

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