OH IN THE ENVIRONMENT OF SGR A

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ABSTRACT. The 18-cm distribution of OH in the Galactic Center region near Sgr A has been mapped in all four of the 1612, 1665, 1667 and 1720 MHz OH absorption lines using the VLA with 4 arcsec angular resolution and 9 kms^{-1} velocity resolution. The OH gas at +50 and +20 kms^{-1} is seen clearly in absorption against the shell structure of Sgr A East but not against the spiral structure of Sgr A West, possibly implying that this molecular gas lies between the two continuum components - behind Sgr A West and in front of Sgr A East. Inside the Circumnuclear Disk, there is a new neutral streamer which sweeps from the disk in towards Sgr A* as the observed radial velocity decreases from +78 to +16 kms^{-1}. The streamer may have a negative-velocity counterpart on the opposite side of Sgr A*.

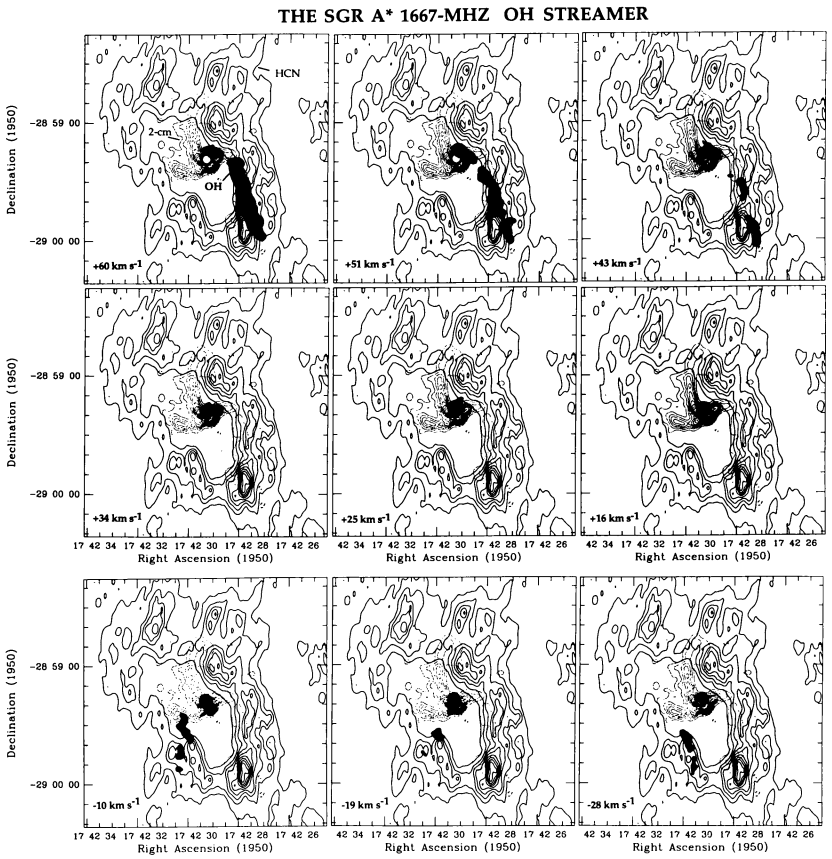
1. OH and the Sgr A Complex

OH appears to surround the Sgr A continuum complex and has its highest concentration just outside the eastern rim of the Sgr A East shell . This was discovered by the lunar occultations of 1968, which also showed clear evidence of OH in the northeastern and southwestern components of the Circumnuclear Disk (CND) (Sandqvist 1974, *A. Ap.* 33, 413). Our VLA observations of the four 18-cm OH lines, with an angular resolution of 4", show that the molecular gas at the velocities of +50 and +20 km s^{-1} is seen in absorption against the eastern and western rims of the Sgr A East shell (Sandqvist et al. 1987, *The Galactic Center*, AIP Proc. Conf. 155, 95). There is, however, no evidence of absorption against Sgr A West. This would imply that Sgr A West is in front of, and Sgr A East behind, the distributed molecular gas. Many of the clumps and features seen in the HCN map of the CND made by Güsten et al. (1987, *The Galactic Center*, AIP Conf. Proc. 155, 103) can also be identified in our OH maps, and the disk's rotation signature can be traced out to +139 km s^{-1} in the northeast component and -151 km s^{-1} in the southwest.

2. The Sgr A* 1667-MHz OH Streamer

We have detected a new molecular gas streamer *inside* the CND which stretches from the disk's southwestern region inwards through the "empty" cavity to the compact non-themal radio source, Sgr A*. This OH streamer is shown in a series of

M. Morris (ed.), The Center of the Galaxy, 421–422.



velocity maps in the figure and superimposed upon the HCN map of Güsten et al. and the 2-cm continuum map of Ekers et al. (1983, *A. Ap.*. 122, 143). At a velocity of +60 km s^{-1} the streamer cuts across the southwestern part of the CND. Note that the negative velocity of the CND in this region differs from that of the streamer by more than 100 km s^{-1} , and the streamer may not necessarily be in the same plane as the CND. The OH streamer moves closer to Sgr A* as the velocity drops until at +16 km s^{-1} it coincides with Sgr A*. The streamer may have a counterpart on the southeastern side of Sgr A* at negative velocities (-10 to -28 km s^{-1}). We have not included the map at -1 km s^{-1} due to possible contamination by unrelated foreground gas, but we refer the interested reader to Fig. 3 of Sandqvist et al. (1987).

It is difficult to understand how the OH streamer can survive in the strong UV radiation field in the cavity inside the CND but the OH may be protected to some extent if it is intermingled with dust. There may indeed be some evidence for such a dust streamer in the same position as the OH streamer, and its possible counterpart, in the near infrared extinction (H-K) map presented by Gatley, Depoy and Fowler at this symposium.

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