TWO NEW VIEWS OF THE GALACTIC CENTER

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The inner few hundred parsecs of the Galactic Center contains ~10% of the molecular ISM in the Galaxy. The conditions in this gas are significantly different from those in molecular clouds elsewhere in the Galaxy. Typical temperatures, densities, and internal velocity dispersions are higher (Güesten 1989). There is also evidence for a large amount of molecular gas which is not bound to distinct clouds (Stark et al. 1989). High velocity bulk gas motions and velocity discontinuities open up the possibility of a role for powerful large-scale shocks in ISM excitation. The very different nature of the dense ISM in the inner Galaxy make it useful as a laboratory for physical effects in the interstellar medium and a proving ground for ideas about the interaction of gas and stars in the nuclei of other galaxies.

We present here two new views of the inner 300 pc of the Milky Way. We have surveyed along the galactic plane in the 609 μm $^3P_1 \rightarrow ^3P_0$ line of C I and the v=1→0 S(1) line of H_2 at 2.12 μm. We made the 3' beam C I observations with a reimaging device at the Caltech Submillimeter Observatory (Plume & Jaffe 1995). We obtained the H_2 strip map on the McDonald Observatory 0.9m telescope with a 3.5′ beam using a Fabry-Perot spectrometer (Luhman et al. 1995a).

Figure 1 shows a longitude–velocity plot for the 492 GHz C I line. C I was detected everywhere along the plane in the region surveyed (l=-0.5 to +1.5 degrees) and its spatial-velocity distribution agrees fairly well with that of CO and ^{13}CO J=2→1. N(C I)/N(CO) ~0.5 near the peaks and is higher elsewhere implying that a large fraction of carbon in the neutral gas is atomic. Figure 2 shows the distribution of H_2 v=1→0 S(1) intensity along the same strip. The H_2 emission peaks at SgrA* where it had been previously detected by Gatley et al. (1986) and is present at a lower level (a few 10^{-6} erg cm^{-2} s^{-1} sr^{-1}) along much of the 2.5° strip we observed. Although extinction strongly affects the emergent intensity distribution, the low level and ubiquity of the H_2 emission argue for UV-fluorescence rather

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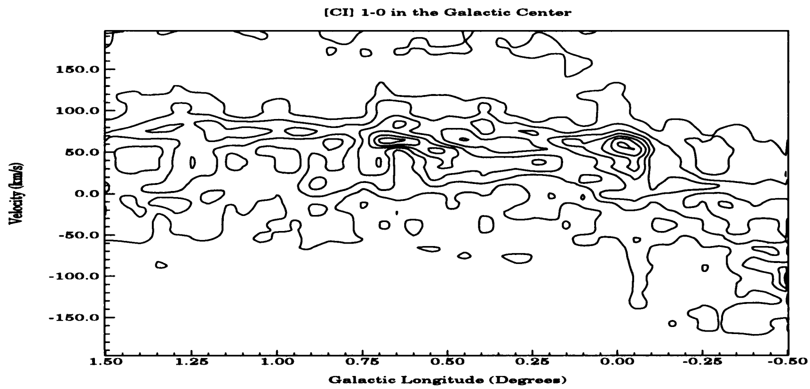

Figure 1. Longitude–velocity diagram for the 492 GHz [C I] $^3P_1 \rightarrow ^3P_0$ transition along a cut at b=-3′. Contour intervals are 2 K km s^{-1} to 41 K km s^{-1} in steps of 6.5 K km s^{-1}.

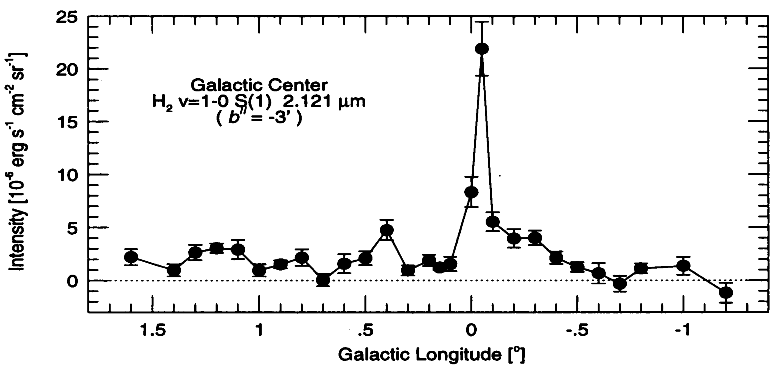

Figure 2. Intensity distribution of the H_2 v=1→0 S(1) line along a cut at b=-3′.

than shocks as the dominant excitation mechanism (see also Luhman et al. 1995b).

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