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MOLECULAR CLOUDS AND STAR FORMATION NEAR THE GALACTIC CENTER

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We present the results of an extensive survey of ^{13}CO and CS emission in the inner 1 kpc region of our Galaxy. The properties of the clouds are very different from molecular clouds observed in the galactic disc: 1) The mean gas density is more than one order of magnitude higher ($\langle n \rangle = 10^4$ cm^{-3}). 2) The internal velocity dispersion is greater by a factor of 5 to 10 (v = 20 to 50 km s^{-1}). 3) Many of the clouds follow highly eccentric orbits about the center. 4) This region contains roughly 10% of the Galaxy's molecular mass, but much less than 10% of the newborn massive stars. Star formation may be inhibited by the large turbulent energy content of the clouds. Some of these properties may result from the large galactic tides in the inner Galaxy. In order for a cloud to remain gravitationally bound despite the shear induced by galactic rotation, the mean gas density must be greater than $\langle n \rangle = 10^4$ cm^{-3}. The velocity dispersion of the gas must be large to satisfy the virial theorem. The forbidden velocities and high latitude extent of some of the emission can be explained by the presence of a stellar bar and does not require a central explosion. Some of the thermal infrared and continuum features of the galactic center can be understood as the direct consequence of cloud-cloud interactions.