

Physical properties of molecular clouds in the southern outer Galaxy

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We have used a deep CO survey of the third galactic quadrant (May et al. 1993) to derive the physical properties of molecular clouds in the outer Galaxy. Within the range of this survey, from 194° to 270° in galactic longitude, 177 molecular clouds have been identified beyond 2 kpc from the Sun. Distances have been determined kinematically using the rotation curve of Brand (1986) with $R_0 = 8.5$ kpc and $\Theta_0 = 220$ km s $^{-1}$. Power-law relations between line widths and sizes of the clouds, and between their densities and sizes have been found, although they do not fulfill exactly the requirements to be in virial equilibrium. Adopting a CO luminosity-to-H $_2$ conversion factor $X = 3.8 \times 10^{20}$ molecules cm $^{-2}$ (K km s $^{-1}$) $^{-1}$, the derived MCO masses statistically agree with the virial masses. The derived size and mass distributions show that the clouds are smaller, less massive and with narrower lines than those in the inner Galaxy. However, the mass spectrum for the clouds in our sample with masses $> 2.5 \times 10^4$ M $_\odot$