

OBSERVATIONS OF CO IN THE PERSEUS ARM

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Observations of the 2.6-mm line of $C^{12}O^{16}$ were made in the galactic plane from $l=105^\circ$ to 150° at 1° intervals. The total velocity coverage is 83.2 km s^{-1} centered at -40 km s^{-1} with resolution equal to 0.65 km s^{-1} . The observations were made first in June 1976 and confirmed in October 1977 after some improvement of the observing facilities at the Aerospace Corporation. The integration time in each direction is 15 minutes, giving 30-noise dispersions of 0.9K. Among the 46 directions, there are 18 CO detections. Twelve of them have CO components moving with the velocities typical of those expected for the Perseus Arm. Most of them are situated in or near the O associations or HII regions in the Perseus Arm, while the others lie in the regions rich in young star clusters. All the velocities observed are in excellent agreement with those expected in the post-shock region in the context of the shock formation model of the spiral density-wave theory. These molecular clouds may be viewed as being formed in the compression phase of the cloud medium as the individual clouds enter the shock front of the intercloud medium. Their line-of-sight velocities are in general a few km s^{-1} more negative than those of the HII regions, the young star clusters, and the O associations in the Perseus Arm. This suggests that these young objects may be formed prior to the observed CO clouds. The CO velocities are in agreement with those of the HI ridge. One CO cloud is observed at $l=148^\circ$, although it is well known that all the tracers of the spiral arm come to an abrupt stop at $l=140^\circ$.