

CO AND CS OBSERVATIONS IN THE EASTERN PART OF W5

S. Wramdemark and G. Lyngå,
Lund Observatory, S-221 00 Lund, Sweden
L.E.B. Johansson,
Onsala Space Observatory, S-430 34 Onsala, Sweden

At galactic longitudes between 132 and 139 degrees and distances of 2 to 2.5 kpc, the galactic disk contains an unusual concentration of gas clouds, young clusters and OB associations (W3, W4 and W5). The small nebula S 201 is situated to the east of W5, which contains the young open cluster IC 1848. Probably associated with S 201 is one of the originally proposed Bok globules; the region also contains three infrared sources.

We have observed a region extending from S 201 to IC 1848A with high spatial resolution in ^{12}CO and ^{13}CO , to investigate in detail the distribution and the kinematics of the molecular gas and its possible connections with optical and infrared objects. To locate high density regions we have also made CS observations in selected areas. The observations were carried out with the 20 m telescope of the Onsala Space Observatory.

Figures 1 and 2 show ^{12}CO channel maps and ^{13}CO integrated data, respectively. The positions of the infrared sources are indicated and optical contours of S 201 and IC 1848A are drawn. Within the observed area there are three centres of activity as indicated by the CO observations, one of each associated with an IR source. The ionised gas around S 201 is distributed in two lobes, separated by the Bok globule. There are two temperature and density maxima in the molecular gas, one on each side of the ionised gas blobs. At the position of the Bok globule there is a distinct ^{13}CO maximum showing a density peak. Using standard assumptions the ^{13}CO emission corresponds to about 100 solar masses for the globule. The morphology of S 201 resembles a "champagne model" described in the literature. The strongest CS emission, and presumably the highest density, is observed just to the east of the HII region. An IRAS source located a few arcmin to the south-west of S 201 coincides with another peak in the CO emission, the velocity of which is 1-2 km/s lower than in nearby areas. The molecular cloud seems to be illuminated from the west giving a bright optical rim, IC 1848A. High resolution CO and CS observations were made across the rim. A discussion of this rim will soon be published.

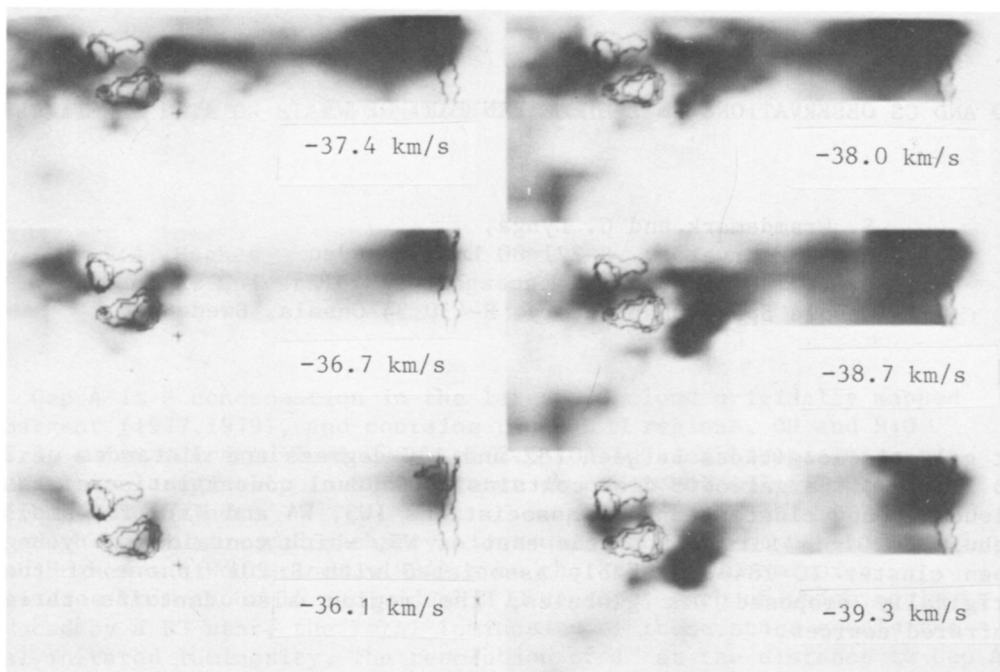


Figure 1. Channel maps of ^{12}CO as observed at Onsala. The contours give the optical appearance of the nebulae S 201 and IC 1848A. IRAS sources are marked by + signs.

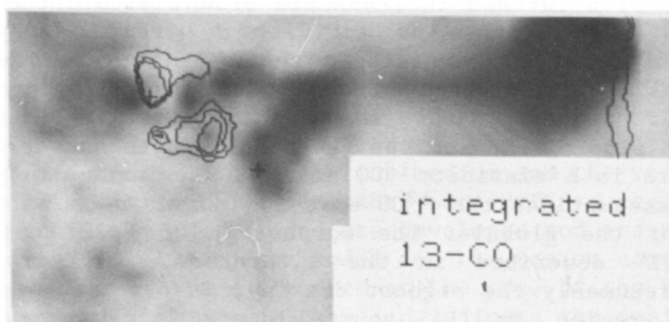


Figure 2. Integrated ^{13}CO radiation as observed at Onsala. Comments as in figure 1.