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CO observations of NGC 7674

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We have mapped the CO(2-1) and (1-0) emission toward NGC 7674, 1st ranked galaxy of Hickson 96, with the IRAM 30-m radiotelescope (Granada, Spain). The beam sizes were $\sim 13''$ and $22''$, respectively. The molecular gas associated with NGC 7674 is overabundant and extended. Both CO transition maps show enhanced emission that seems to be associated with the spiral arms of the galaxy. We obtained a total mass of 2×10^{10} $M_\odot$. A comparison of the masses of the interstellar gas in the molecular and atomic gas phases leads to a value of $M(H_2)/M(HI) \sim 2$ according to the interacting nature of the galaxy and its high infrared luminosity.

RESULTS AND DISCUSSION

We have mapped the CO(2-1) and (1-0) emission of the 1st ranked galaxy of the compact group Hickson 96, NGC 7674. There is a growing body of theoretical and observational studies of Hickson groups. However, nor the molecular component of Hickson groups neither its abundance relative to the atomic component, have been inspected. It is not known, however, whether an extrapolation of the molecular properties of Hickson groups can be done from isolated galaxies and pairs.

For these reason we have mapped the CO(2-1) and (1-0) emission toward NGC 7674 with the 30-m telescope of the Institut de Radio Astronomie Millimétrique (IRAM) at Pico Veleta (Granada, Spain). The beam sizes were $\sim 13''$ and $22''$, respectively.

The CO emission toward NGC 7674 is overabundant as compared to normal galaxies. A main peak exists toward the center, together with enhanced emission coming from the spiral arms of the galaxy.

The intensity of the CO($J = 2 \rightarrow 1$) line is ~ 0.6 times that of the CO($J = 1 \rightarrow 0$) line. This ratio varies within the galaxy from one side to the other, which could indicate different excitation conditions due to the proximity of HCK 96c to one of the sides. The H_2 column density, mass and luminosity of the galaxy for a radius of $\sim 20''$ is $N(H_2) = 5.2 \times 10^{21}\, cm^{-2}$, $M(H_2) = 1.9 \times 10^{10}\, M_\odot$ and $L_{CO} = 1 \times 10^9$ K

km s^{-1} pc^2. A comparison of the masses of the interstellar gas in the molecular and atomic gas phases leads to a value of $M(H_2)/M(HI) \sim 2$ according to the interacting nature of the galaxy and its high infrared luminosity. The total mass is similar to that calculated by Mirabel (1982) with 21 cm observations and a beamsize of 3'.3, which indicates that the molecular gas is not extended.

References

Mirabel, I. F. 1982, *ApJ*, **260**, 75.