H I SURVEY ON THE MAGELLANIC CLOUDS WITH THE IAR RADIOTELESCOPE

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The 21 cm H I line survey of the southern sky at declinations below −25°, which is being carried out from the IAR, (reported separately), was planned in such a way that the emphasis was put, initially, on the observation of a region covering the Magellanic Clouds and their surroundings. For this reason, even with only 50% of the survey being completed, it is possible to use the data for studying these objects. The velocity range in which the Clouds are detected makes unnecessary, at least for the H I line emission of the Galaxy, the correction for stray radiation.

Several kinds of objects may be studied with these data: a) the regions where the Large and Small Clouds are optically visible; b) the Bridge between the Clouds; c) the Magellanic Stream, and d) the H I in front and behind the Clouds. For each of these objects it is possible, with the H I data, to study the gas distribution and the dynamics of each of the velocity components. This work is being carried out at present and some preliminary maps have been shown at the meeting.

The Magellanic Clouds have been observed previously in the H I line on several occasions. The particular characteristics of this survey, however, are the extension, the complete coverage of the grid (with 30′ (one beam) spacing), the sensitivity (rms ≤ 0.07 K in brightness temperature) and the velocity resolution (1 km/s).

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STRUCTURE OF GALACTIC SATELLITES: CIRCULAR AND ELLIPTICAL ORBITS

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Globular clusters are not spherical, instead they exhibit different degrees of ellipticity. While that ellipticity is usually interpreted in terms of flattened systems, perhaps due to rotation, it might be due in fact to prolate figures that arise simply from the tidal effect of the galaxy on its satellites. Recently, Heggie & Ramamani (1995) studied the shapes of the clusters by means of numerical methods and concluded that they are triaxial; we extend that work using numerical simulations and analyze the deviations from sphericity of satellites due to their interaction with their parent galaxy. We conclude that tidal forces do affect the observed shapes of the satellites and they cannot be neglected.

In our models the galaxy is represented by the fixed potential of a singular isothermal sphere, and the satellite is modeled as a King sphere. We consider circular and elliptical orbits and include satellites with different concentrations and at different pericentric distances. The integration is performed with an N-body code which includes Chandrasekhar's dynamical friction.

In all the cases we calculate the semi-axis ratios of the moment of inertia tensors and compute the ellipticities from images of projections of the satellites (including only bound particles). The forms of the galactic satellites that result from our simulations, for both circular and elliptical orbits, are clearly prolate. In the case of circular orbits, the prolate figures have their longest axis pointing in the direction to the galactic centre. In the case of elliptical orbits, the longest axis lags behind the direction to the galactic centre, as has already been remarked by Miller (1986).

Heggie, D.C., & Ramamani, N. 1995, MNRAS 272, 317.

Miller, R.H. 1986 A&A 167, 41.

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CHEMICAL GRADIENTS IN THE GALAXY

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We have extended Carigi (1994) with a chemical evolution model for the galactic disk under the following assumptions: 1) The galactic disk sets up only by infall of primordial gas, and consists of a series of independent concentric rings without loss of material. 2) The infall rate as a function of galactrocentric distance and time is proportional to $e^{-t/\tau(r)}$, with $\tau(r) = 0.6r - 1.8$, such that the present total mass surface density is proportional to $e^{-r/3kpc}$. 3) SFR $\propto \sigma_T^{0.4}(r,t)\sigma_{gas}^{1.4}(r,t)$. 4) The mass range of the adopted IMF (Kroupa, Tout, & Gilmore 1993) is taken from 0.01 to 120 $M_\odot$.

Results: 1) The chemical history of the solar neighborhood ($r \simeq 8$ kpc) is excellently reproduced. 2) We get a good agreement with the observed

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