NEW DETERMINATION OF KINEMATIC DISTANCES TO GALACTIC PLANETARY NEBULAE

Walter J. Maciel[1]

Measurements of the equivalent width of the interstellar Lyman alpha line from IUE spectra in the direction of several galactic planetary nebulae are used to determine the hydrogen column densities in these directions.

Also, hydrogen 21 cm profiles from the Berkeley survey are used in connection with the ultraviolet data so that the expected rotation velocities and distances can be determined.

The derived distances are: $d = 1600$ pc (NGC 7009); $d = 800$ pc (BD+303639); $d = 1400$ pc (NGC 2371), and $d = 1900$ pc (NGC 2392). These results seem to indicate that these objects have distances close to the so-called "long" distance scale as applied to planetary nebulae, except for BD+303639, for which the short distance derived is probably a lower limit. The limitations of the method are discussed, and the results are compared with recently published distances. A fuller description of the method can be found in Maciel (1995, Ap&SS 229, 203).

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[1]Instituto Astronômico e Geofísico, Universidade de São Paulo, Brazil

MAGNETIC FIELD STRUCTURE OF THE SMALL MAGELLANIC CLOUD

A.M. Magalhães[1], V.E. Margoniner [1], A. Pereyra [1], C.V. Rodrigues [2], and G.V. Coyne [3]

We describe an on-going observational program to determine the magnetic field structure of the Small Magellanic Cloud (SMC). The project employs CCD images which allow the determination of the linear polarization of a large number of stars in each field. The data has been gathered mainly in the Northeast and Wing sections of the SMC. These regions have been presumably affected by past interactions with the Large Magellanic Cloud. In this poster, we illustrated the technique employed using one of the imaged fields as an example.

The CTIO CCD Camera at the 1.5-m telescope has been modified in order to perform high precision polarimetry of each object in the field. In front of the CCD and V filter, we used a rotating half-wave plate and a fixed, composite calcite prism. For each of about 30 fields, a set of images was taken at 4 positions of the waveplate. We perform the photometry of the double images of each star in the field using IRAF tasks. A FORTRAN program, run as an IRAF task, uses the photometric data and provides the degree of polarization, P, and its position angle, θ, for each star, together with the measurement error. Other additional, support tasks have been also developed.

The technique described here presents several advantages, among them: the large number of objects per field that can be measured, the accuracy achievable, the fainter limiting magnitude and the determination of the foreground polarization towards each field.

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[1]Instituto Astronômico e Geofísico, Universidade de São Paulo, Brazil

[2]Depto. de Astrofísica, Inst. Nac. de Pesquisas Espaciais, DAS-INPE, Brazil

[3]Vatican Observatory and Steward Observatory