

A VLA RADIO CONTINUUM SURVEY OF PLANETARY NEBULAE

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ABSTRACT. With the Very Large Array it is now possible to make high resolution radio continuum maps with sensitivity less than a milliJansky in an observation of only 5 minutes. We have used this so-called snapshot capability to measure about 400 PN north of declination -35 . Most of the measurements were carried out at 6 cm. Some of the stronger sources were observed at several frequencies. Most sources were detected, however many nebulae were too weak to map in detail. The resolution ranges from $1.5''$ to $1'$, depending on the size of the PN. The selected PN have sizes in the range from $4''$ to $6'$.

From this sample we will get the following results: 1) accurate values for the total flux densities will be obtained. Most published radio flux densities of planetary nebulae were obtained with single dish radio telescopes which compared to VLA measurements have a much lower sensitivity and suffer from confusion. 2) The total radio flux density in combination with the angular size of the nebulae allows physical quantities to be derived, such as ionized mass and density as function of the distance. 3) A comparison with the total far infrared flux yields the infrared excess (IRE). The IRE is an indication of the evolutionary stage of the PN. For nebulae which are optically thick to the stellar radiation, the IRE also gives an estimate for the temperature of the central star. 4) The morphology of the nebulae can be used to model the density distribution. In many cases the morphology also distinguishes H II regions from PN.

All observations have been completed, but data reduction is still in progress. As a preliminary result we found that pk 132-0.1, 169-0.1 (Ic2120), 195-0.1, 35-0.1, 223-2.1, 118+2.1 and 176+0.1, all of which are classified as planetary nebulae, probably are H II regions. We plan to publish the final results in the form of a catalog. This catalog will contain total radio flux densities or upper limits for all of the measured nebulae, and maps for those for which we had sufficient resolution and adequate signal to noise. Preliminary results will be presented at the conference.