

Neutral Hydrogen Observations of dI Galaxies in the Virgo Cluster

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We are in the midst of obtaining 21 cm observations of late-type (Sdm through ImV, including BCD) dwarf galaxies in the Virgo Cluster, selected from the Binggeli, Sandage and Tammann catalog (1985, in press). To date, we have observed 174 of these objects; the sample is nearly complete to $B_T = 17.0$. 114 have been detected, and 37 of the strongest emitters have been mapped at 1!9 spacing to determine HI diameters and rotation curves.

For every detected galaxy we have two bits of information relevant to massive halos: the profile width ΔV and an indication of whether or not the object is in disk-like rotation with a component of the rotation velocity parallel to the line of sight (i.e., whether or not the profile shows the classic "double-horned" shape at 8 km/s resolution). 37 of the 114 detected dwarfs do indeed show double-horned profiles; this fraction is largest for Sdm and Sm and decreases toward later types. It is evident that the ratio of turbulent to rotational velocities increases toward the later types. On Fisher-Tully diagrams (with ΔV corrected for inclination as in Hoffman, Helou, Salpeter and Sandage 1985, *Ap. J. Lett.* 289, L15), the dwarfs continue the ridge-line of the brighter Virgo spirals irrespective of whether or not the profiles are double-horned. Mass-to-light ratios computed from the inclination-corrected ΔV and optical diameters are not very different those for bright spirals.

For 16 of the 37 mapped dwarfs we have been able to determine "isophotal" HI radii -- the outermost positions from which we think we can reliably detect emission. This was possible only for dwarfs which were clearly rotating. The mean ratio of HI to optical radii for these resolved dwarfs is if anything larger than for a representative sample of faint spirals (similar B_T and diameters), mapped in identical fashion. These resolved objects allow a determination of indicative M/L using the HI diameter (assuming the gas at that point is in an inclined circular orbit); for the 16 dwarfs we get $M/L = 12 \pm 2$ (solar units) while for the representative spirals 7 ± 1 .

A comparison of rotation curves for mapped dwarfs with those for faint spirals similarly mapped shows that, for those that exhibit rotation, there is if anything a more pronounced tendency toward rising rotation curves for the dwarfs; however, a substantial fraction of the dwarfs exhibit turbulent motions (i.e., Gaussian profiles) rather than organized rotation.

Admittedly there may be selection effects; the resolved dwarfs are among the brightest dwarfs in HI (yet spanning the full range of morphological types) whereas the spirals are a representative sample. But it is clear that at least some of the dwarfs (of all types) have massive halos very much like scaled-down versions of larger spirals.