DISTRIBUTION OF DARK MATTER IN POLAR RING GALAXIES

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The discovery of SO galaxies with polar rings makes it possible to directly measure the gravitational potential of a galaxy in three dimensions. Schweizer, Whitmore and Rubin (1983) find a spherical potential in the case of A0136-0801. We have observed three more polar ring galaxies using the 4 meter telescope at CTIO. The following table summarizes the results for these three systems as well as A0136-0801, and figure 1 shows an example of the data.

Galaxy	V_{ring}/V_{disk}	σ_o	V_{disk}/σ_o
A0136-0801	0.94 ± 0.17	67 ± 7	2.3 ± 0.3
NGC 4650A	0.90 ± 0.11	77 ± 8	1.6 ± 0.2
ESO415-G26	1.07 ± 0.13	127 ± 6	1.4 ± 0.2
AM2020-5050	0.32 ± 0.07	159 ± 12	0.4 ± 0.1

For the top three galaxies, a comparison of the rotational velocity of the SO disk to the perpendicular polar ring at the same radius (V_{ring}/V_{disk}) provides a measurement of the shape of the gravitational potential. The average value of V_{ring}/V_{disk} for these galaxies is 0.97 ± 0.08, corresponding to a nearly spherical shape for the halo.

The low value of V_{disk}/σ_o (where σ_o is the central stellar velocity dispersion) for AM2020-5050 shows that the inner component of this system is probably an elliptical galaxy rather than an SO disk.

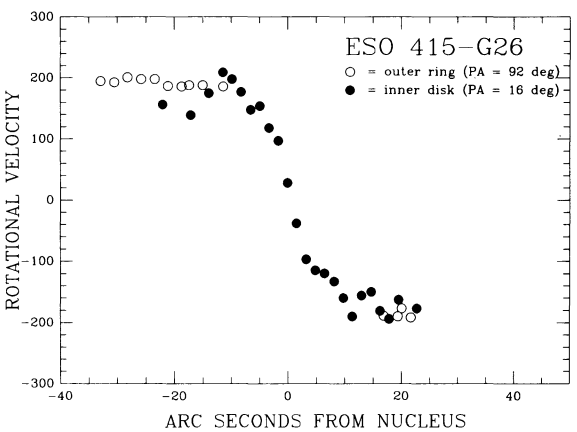

Figure 1 - Rotation curve for both components of ESO415-G26

REFERENCE

Schweizer, Whitmore, and Rubin 1983, A.J., **88**, 909.

J. Kormendy and G. R. Knapp (eds.), Dark Matter in the Universe, 315.