

DIFFERENCES IN MASS DISTRIBUTION FOR FIELD AND CLUSTER SPIRAL GALAXIES

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Our group has now obtained rotation curves for 80 spiral galaxies, Hubble types Sa through Sd. As described in Rubin et al. (Ap. J. 289, 81; 1985), the forms of these rotation curves are similar for all Hubble types. Given this observational fact, we have chosen to analyze the mass distributions for these galaxies under the assumption that the mass distributions for all spirals can be described by the same three-dimensional form, here taken to be spherical for simplicity. The mass distribution forms for 71 of these galaxies can be placed into a simple classification scheme based on the curvature of mass distribution form in a $\log(\text{radius}) - \log(\text{integral mass})$ diagram. The three most common mass forms among this continuum are termed Types I, II and III, the forms of which are displayed below (see also the discussion by Rubin elsewhere in this Symposium).

The forms of mass distribution show no correlation with galaxy size, luminosity or mass density, and little correlation with Hubble type (see Burstein and Rubin, Ap. J., Oct. 1985 for details). However, we do find an environmental dependence of Mass Type: Of the 54 field galaxies with good Mass Types, 27 are of Type I (50%) and 11 are of Type III (20%). Of the 18 analogous galaxies in clusters (ranging in Hubble type from Sb to Sd/Irr), none are of Type I (0%) and 9 are of Type III (50%).

The details of the correlation of Mass Type with environment will be discussed in a future paper.

