THE ENERGETICS OF FLAT AND ROTATING EARLY-TYPE GALAXIES AND THEIR X-RAY LUMINOSITY

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1. The problem and the results

A multivariate statistical analysis of data measuring the optical and X-ray properties of the *Einstein* sample of early-type galaxies (Eskridge *et al.* 1995) showed that: 1) on average S0s have lower X-ray luminosity L_X at fixed optical luminosity L_B than do Es; 2) at fixed L_B the X-ray brightest galaxies are also the roundest; this correlation holds for both morphological subsets of Es and S0s. We investigate whether a flat and partially rotationally supported galaxy is expected to host a different gas flow phase (and so a largely different amount of hot gas) with respect to a spherical pressure supported galaxy of the same L_B. This is accomplished using the global energetic balance of the hot gas flows, and axisymmetric two-component galaxy models (Ciotti and Pellegrini 1995).

It results that, for a general stellar system, the critical variations in the energy budget can be produced only by a change in the galaxy structure, not by rotation, independently of the problem of the unknown amount of thermalization of the ordered stellar motions. Reasonable flattenings at fixed L_B can make the gas less bound, even when the central stellar velocity dispersion is comparable to or higher than that of the round galaxy.

References

Eskridge, P., Fabbiano, G., and Kim, D.W., (1995), *Ap. J. Suppl. Ser.*, **442**, 523
Ciotti, L., and Pellegrini, S., 1995, submitted to *M.N.R.A.S.*