

PARENT STRUCTURES IN E AND SO GALAXIES ?

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ABSTRACT. Isophote shape and flattening are being used for studying a similarity between elliptical and lenticular galaxies.

One of us (Michard 1984) found a similarity between the ellipticity profiles of E galaxies flatter than E3 and those of SO's of equivalent apparent flattening. It was suggested that Ellipticals might have a two-component structure akin to the classical SO picture.

With the aim of investigating this, we have begun to parametrize the shape of isophotes for a sample of E and SO galaxies (B-band data from Michard 1985 together with new unpublished photographic material). Following Carter (1978), we describe an isophote by its best fitting ellipse and parameters which quantify the deviation from this ellipse. An isophote is represented by:

$$\begin{aligned}x &= a (1 + e_4 \cos 4t + e_6 \cos 6t + \dots) \cos t \\y &= c (1 + e_4 \cos 4t + e_6 \cos 6t + \dots) \sin t,\end{aligned}$$

where x,y are cartesian coordinates, a,c are the axes of the ellipse, and t is a polar angle; e₄,e₆ ... are the shape parameters, e₄ being by far the most significant. A box-shaped isophote gives e₄<0, a pure ellipse e₄=0, and a "pointed" isophote e₄>0. A position angle of major-axis is also obtained. We use algorithms and codes developed by Dr. A.Bijaoui starting from the work of Kuhl and Giardina (1982).

For many SO's, the departures from ellipses are obvious, and Figure 1 shows a typical example: e₄ is positive at intermediate radii, and further out c/a eventually rises, where the bulge is thought to become dominant again.

E-classified galaxies exhibit a variety of behaviours; because of space limitation, only one is displayed here (Figure 2). There is often a strong similarity with SO's, for both c/a and e₄. This is evidence that there exists, in these Ellipticals, a structure locally much flatter than indicated by the minimum value of c/a alone.

Only a dozen galaxies have been reduced so far, and we are processing more data in order to obtain significant statistics. This

should eventually provide insights on the transition between E and S0 galaxies, at least we hope so.

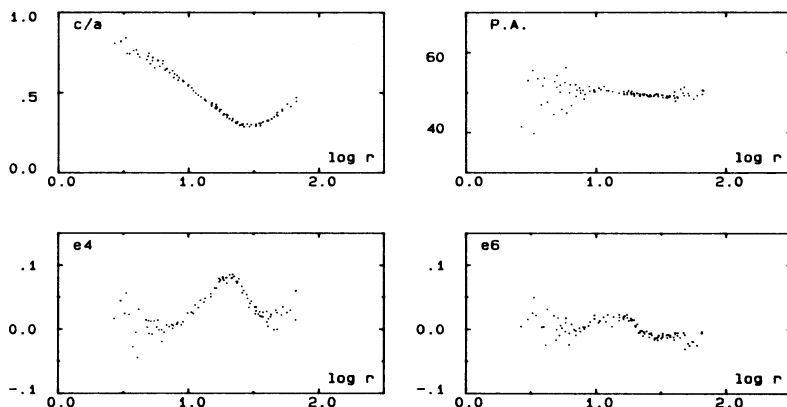


Figure 1. NGC 4417 (type S0): plots of axial ratio c/a , position angle P.A. of major-axis, and coefficients e_4 and e_6 , versus $\log r$ ($r = \sqrt{a^2 + b^2}$, in arcsec). In this particular case, e_6 also is significantly positive, near $\log r = 1.2$.

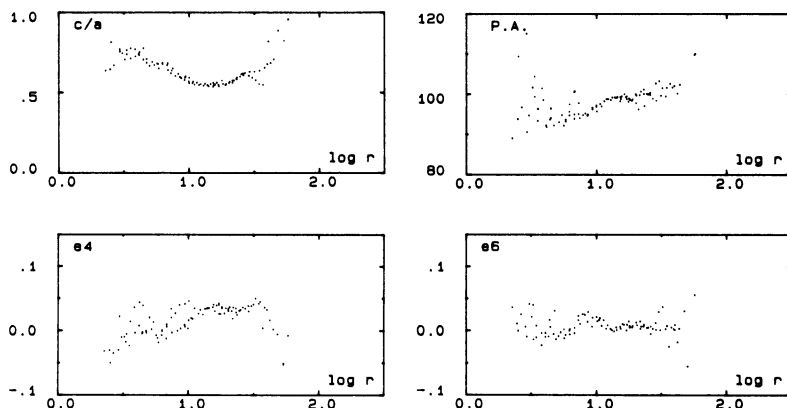


Figure 2. NGC 4660 (type E5): same plots as for Figure 1.

REFERENCES

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