

STATISTICS OF GALAXY ORIENTATIONS: MORPHOLOGY AND THE LARGE SCALE STRUCTURE

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Using the Uppsala General Catalog of bright galaxies (Nilson, 1973) and the northern and southern galaxy maps (Seldner, et al., 1977) made from the Lick counts (Shane and Wirtanen, 1967), we find statistical evidence of a morphology-orientation effect. Our results indicate that elliptical galaxies are preferentially oriented along the large scale features of the Lick maps. However, position angles of spiral and S0 galaxies show no clear signs of non-random behavior. The angular scale of the detected alignment effect for ellipticals is $\theta \sim 2$ to 4° , which at a redshift of $Z \sim .03$ (which comprises the depths of both catalogs) corresponds to a linear scale of ~ 3 to $6 h^{-1}$ Mpc.

It is interesting to note that the alignment effects for ellipticals not in rich clusters are comparable to those of the brightest cluster galaxies reported in the previous paper, though the linear scale of the alignment detection is smaller. A possible explanation for the morphology dependence of the alignment effect reported here might be that while a frozen anisotropy is acquired by ellipticals by collapse from the large scale distribution of matter, spin axes of spirals would depend on the more nearby mass concentrations if rotation is caused by tidal torques.

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