NON-GAUSSIAN ISOCURVATURE MODELS

Testing the viability of a χ^2 isocurvature model

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Peebles (1997) has proposed a non-Gaussian χ^2 isocurvature model which gives rise to early galaxy assembly at redshifts $\geq 3-4$. We test whether the higher order moments (skewness and kurtosis) of such a model are compatible with the moments of the observed density field, and find that in the absence of bias these models produce moments that are much higher than those measured for the APM survey (Gaztañaga, 1994). We have applied different biasing schemes to see whether bias can bring the moments down, and find that for power law, Cen-Ostriker, and censor threshold biasing schemes (Mann et al 1997) the moments can be brought into agreement with the APM measurements only for linear bias values $b > 3$. This however, would give a redshift distortion parameter, $\beta_{optical} = (\Omega^{0.6}/b) < 0.16$ which is inconsistent with current estimates from redshift surveys of $\beta_{optical} = 0.40 \pm 0.12$ (e.g. Peacock 1997). We conclude that for an acceptable level of bias in the schemes we have tested, the χ^2 isocurvature model moments disagree with current measurements of skewness and kurtosis from the APM survey.

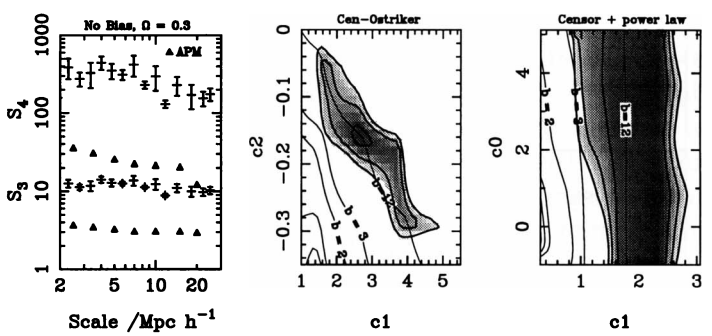

Figure 1. Left: APM and Isocurvature skewness and kurtosis. Contour plots: Shaded contours show areas of bias parameter space consistent with APM moments at the one, two & three σ level. Lighter line contours indicate regions of constant linear bias.

K. Sato (ed.), Cosmological Parameters and the Evolution of the Universe, 268.