

Power Spectrum of the Large-Scale Peculiar Momentum Field

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It is shown that the power spectrum of the large-scale momentum field can be directly calculated from the radial peculiar velocity survey data, and thus can be compared with the predictions of cosmological models. This is possible because the power spectrum of the radial component of the momentum field is close to $\frac{1}{3}$ of that of the total momentum field.

The shape of the quasi-linear and non-linear parts of the momentum power spectrum are found to be nearly independent of cosmological models. This fact allows us to measure the overall amplitude of the momentum power spectrum accurately.

The momentum power spectrum is measured for the MAT sample in the Mark III catalog of peculiar velocities of galaxies. The estimated momentum and density power spectra indicate that the β parameter is $\beta = \Omega^{0.6}/b = 0.47_{-0.09}^{+0.10}$, where Ω is the density parameter and b is the bias factor.