

**Measurements of the Power Spectrum and Redshift  
Distortions of the Las Campanas Redshift Survey**

by

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The final copy of this thesis has been examined by the signatories, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the above mentioned discipline.

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Measurements of the Power Spectrum and Redshift Distortions of the Las Campanas Redshift Survey

Thesis directed by Professor Andrew Hamilton

I present a new method for extracting power spectra from galaxy redshift surveys called the pair weight compression method. I then apply the method to determine the redshift power spectrum of the Las Campanas Redshift Survey (LCRS). The measured redshift power spectrum has the same shape as that found by Lin et al. (1996b) but is a factor of 2 smaller. Upon expanding the method to include linear redshift distortions, the method is able to measure real space power spectra and  $\beta$ .  $\beta \approx \Omega_m^{0.6}/b$  where  $\beta$  is the linear redshift distortion parameter,  $\Omega_m$  is the cosmological density of matter and  $b$  is the linear galaxy to mass “bias factor.” Applying the method to LCRS yields a real space power spectrum that is very similar to the redshift space power spectrum. The measured value of  $\beta \approx .55_{-.30}^{+.35}$  is larger than, but consistent with, a previous measurement by Matsubara et al. (2000).

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