Abstract Submitted for the TSF11 Meeting of The American Physical Society

Self-Calibration Technique for 3-point Intrinsic Alignment Correlations in Weak Gravitational Lensing Surveys<sup>1</sup> MICHAEL TROXEL, MUSTAPHA ISHAK, Univ. of Texas at Dallas — Weak gravitational lensing can be used to constrain cosmological parameters to high precision using the 2- and 3-point weak lensing shear correlations. The intrinsic alignment (IA) of galaxies has been shown to be a significant barrier to precision weak lensing measurements. We review a proposed self-calibration technique to calculate the induced gravitational lensing-galaxy intrinsic alignment correlation (GI) for the power spectrum in weak gravitational lensing surveys with photometric redshift measurements, which is expected to reduce the IA contamination by at least a factor of 10 for currently proposed surveys. We confirm this using an independent analysis and propose an expansion to the self-calibration technique for the weak lensing bispectrum in order to calculate the dominant lensing-lensing-intrinsic alignment correlation (GGI). We explore the performance of the GGI self-calibration technique and show that it can potentially reduce the IA contamination by up to a factor of 5-10 for most redshift bin choices. The self-calibration thus promises to be an efficient technique to remove both the 2-point and 3-point intrinsic alignment contamination from weak gravitational lensing measurements.

<sup>1</sup>Supporting grants from NASA and NSF.

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Date submitted: 08 Sep 2011

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