Abstract Submitted
for the APR13 Meeting of
The American Physical Society

Controlling for the Effects of Baryons in Cosmic Shear Constraints on Dark Energy ANDREW ZENTNER, University of Pittsburgh — The uncertainty introduced by the effects of baryons on the power spectrum of the convergence field is a significant theoretical error limiting forthcoming gravitational lensing surveys. A proposed method to account for baryonic effects is to include parameters that characterize dark matter halos, and to fit lensing data to these halo parameters concurrently with the cosmological parameters. We test this proposal by using this technique to model convergence power spectrum predictions from a set of cosmological simulations. We estimate biases in dark energy parameters that would be incurred if one were to fit the spectra predicted by the simulations either with no model for baryons, or with the proposed method. Neglecting baryonic effects leads to biases in dark energy parameters that are several times the statistical errors of surveys like the Dark Energy Survey. The proposed method to correct for baryonic effects renders the residual biases in dark energy equation of state parameters smaller than the statistical errors. These results suggest that this mitigation method may be applied to analyze convergence spectra from a survey like the Dark Energy Survey. For significantly larger surveys, such as the LSST or Euclid, the biases introduced by baryonic effects remain significant.

Andrew Zentner
The University of Pittsburgh

Date submitted: 14 Jan 2013 Electronic form version 1.4