

Non-linear simulations of cosmological weak gravitational lensing

A. Stewart^a and J. Hamann^a

^a*School of Physics, The University of New South Wales, Sydney, New South Wales 2052, Australia.*

Photons emitted by distant objects are deflected by the large scale structure of the universe - an effect known as weak gravitational lensing (WL). The resulting images are subject to distortion (shear) and magnification (convergence), measurements of which are powerful probes of cosmology. Analytic weak lensing calculations based on linear perturbation theory, while adequate for current WL data, fail to capture non-linear effects that can be probed by future WL surveys. We perform fully non-linear simulations of cosmological weak lensing, using N-body simulations and the multiple lens plane algorithm to construct realistic shear and distortion maps. This will enable future surveys such as LSST or Euclid to extract the full non-linear information contained in their data.