

EFTofLSS

Tobias Baldauf

June 10, 2017

Contents

1	Introduction to LSS dynamics	1
2	Standard cosmological perturbation theory and statistics	1
3	Effective Field Theory Approach	1
4	Applications: Bias, Baryons, Redshift Space Distortions, Parameter Forecasts	2

1 Introduction to LSS dynamics

- Setting the stage: observables (power spectrum, bispectrum, biased tracers) and goals (neutrino mass, primordial non-Gaussianity)
- Dynamics of LSS in Eulerian and Lagrangian formulation

2 Standard cosmological perturbation theory and statistics

- phenomenology of LSS (linear regime, non-linear perturbative regime, non-perturbative regime and virialization)
- derivation of the gravitational Kernels
- Statistics

3 Effective Field Theory Approach

- failures of standard perturbation theory
- coarse grained equations of motion and effective equations of motion (maybe dim reg)
- counterterms and divergencies/UV-sensitivities
- non-locality in time
- matching of the counterterms

4 Applications: Bias, Baryons, Redshift Space Distortions, Parameter Forecasts

- generation of non-local bias from dynamics, symmetry allowed operators
- EFT for biased tracers and redshift space distortions
- potential of EFT approaches for learning about fundamental physics from observations