PBJ: a fast pipeline for the analysis of Stage-IV galaxy clustering data

Ongoing spectroscopic Stage-IV galaxy surveys, such as Euclid and DESI, are starting to deliver high precision data that will allow to map the Universe over unprecedented volume and measure cosmological observables with high precision, with the ultimate goal of investigating the dark sector. Inferring cosmological parameters from such measurements requires fast and flexible analysis pipelines and a tight control over systematics, both theoretical and observational. Additionally, maximising information extracted from the data by including both nonlinear scales and higher order statistics is crucial to ensure the success of these cosmological experiments. I will present recent developments in PBJ, a Bayesian inference pipeline for the joint analysis of the power spectrum and bispectrum, an describe results from Stage-III data from the BOSS survey. The pipeline features the state-of-the art EFTofLSS model for the nonlinear galaxy power spectrum and a tree-level model for the bispectrum, as well as the possibility to include data from the post-reconstruction power spectrum, and several sampler to explore the parameter space. I will also give an overview of the usecases within the Euclid collaboration, which include updated forecasts, investigation of projection effects in the posterior distributions for extended cosmological models, the analysis of beyond-LCDM cosmologies and studies of systematics impact on the cosmological constraints.

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