Contribution ID: **38** Type: **not specified**

Galaxy density-independent selection of Cosmic Void clustering sample and improvement of BAO scale measurement

Friday 25 September 2020 10:00 (20 minutes)

Baryon Acoustic Oscillations provide a standard ruler for measuring distances far back into the history of the Universe. The Galaxy-Galaxy two-point correlation function (2PCF) is the standard proxy for the measurement of the BAO scale using large-scale spectroscopic surveys. There is, however, information beyond the two-point statistics encoded in the galaxy distribution that can be extracted in order to improve the BAO scale measurement. One approach is to make use of the distribution of Cosmic Voids, broadly defined as minima in the matter density field. Previous studies shown that it does yield an improvement for BOSS low-z data (Zhao et al. 2020). Our aim is to improve upon this method by defining the Cosmic Void clustering sample in a galaxy density-independent way, which is useful when analyzing matter tracers with different observed densities.

We define a generalized void radius cut based on the local matter tracer density that maximizes the BAO peak signal-to-noise ratio by construction and minimizes systematical effects due to galaxy incompleteness. We apply this cut to simulations and BOSS DR12 data. However, BAO fitting results seem roughly equivalent to those using the constant (galaxy density-dependent) radius cut on the BOSS DR12 data. This approach can, however, be extended to other matter tracers (ELGs, QSOs) used in current redshift surveys such as the recent eBOSS data release or the up-coming DESI survey.

Authors: FORERO SANCHEZ, Daniel Felipe (EPFL - EPF Lausanne); Dr ZHAO, Cheng (EPFL); KNEIB, Jean-Paul (EPFL)

Presenter: FORERO SANCHEZ, Daniel Felipe (EPFL - EPF Lausanne)

Session Classification: CoCo