



ID de Contribution: 20

Type: Poster

Modelling QSO infall velocity distribution using N-body simulations for eBOSS RSD analysis

mardi 10 mai 2016 10:15 (20 minutes)

The eBOSS multi-object spectrograph has undertaken a survey of Quasars (QSO) in the redshift range $0.9 < z < 2.2$. It will measure the growth rate of structures from the Redshift Space Distortions (RSD) of the 2-point correlation function and allow for a test of general relativity modifications and dark energy scenarios.

To perform this measurement, special care should be given to the RSD model. The most popular model is the Gaussian Streaming model which convolutes a Gaussian probability distribution for infall velocities with the real space correlation function.

In this poster, we will present one of the most recent RSD model based on Convolution Lagrangian Perturbation Theory and its applicability for the QSO tracer. Moreover, using N-body simulations, the Halo occupancy distribution of QSO in dark matter halos can be investigated and we will examine at which scale this model is valid in the redshift range of eBOSS. Furthermore, the pairwise velocity distribution displays exponential tails at odds with the Gaussian streaming model. We will present an attempt to parametrize the full infall velocity distribution from N-body simulations. Then using a specific streaming model, we plan to quantify the difference with the Gaussian Streaming Model.

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Classification de Session: Poster session

Classification de thématique: Cosmology & Astroparticles