CO-Lya cross-correlation: present and future steps in simulation and analysis

Dongwoo Chung[*1]

[1]Kavli Institute for Particle Astrophysics and Cosmology, Stanford University – United States

Abstract

Cross-correlation of line-intensity data, when done against independently obtained data covering the same cosmic volume, provides strong validation of the data through enhanced detection significance and foreground rejection, and also provides added science value for all involved. In this spirit, the CO Mapping Array Pathfinder (COMAP), a CO line-intensity survey of molecular gas at z = 2.4-3.4, is expected to target a subset of the footprint of the Hobby-Eberly Telescope Dark Energy eXperiment (HETDEX), a survey of near a million Lyman-alpha emitters at z = 1.9-3.5. I will discuss the initial simulations of CO-galaxy and CO-LAE cross-correlation (ApJ, 872, 186; arXiv:1809.04550) that led to this strategy, and in particular what led to choosing the HETDEX footprint over other heavily surveyed fields like COSMOS. I will also discuss the limitations of this work, particularly in Lyman-alpha modelling, and suggest what additional future work must occur both for better anticipation of the signal and better interpretation once the data are in hand.

---

[*]Speaker