
Connecting the CGM from strong absorbers with galaxy dark-matter halos

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Abstract

Absorption lines in spectra of background objects such as luminous quasars reveal clouds of intervening gas with relatively low metal enrichments out to high redshifts. During the past few years it has become clear that the strongest Hydrogen absorption lines arise in disks or in the circum galactic medium of galaxies that randomly lie along the line of sight to background sources.

Akin to the relation between stellar mass and metallicity seen in emission-selected galaxy samples, similar relations for absorption lines exist, i.e. the more metal-rich absorbers belong to more massive galaxies. On the other hand, it means that the majority of absorbers, which have metallicities around 10% solar, arise in very low-mass galaxies. From other scaling relations we know that the velocity widths of the absorption lines are related to the metallicities. Because mass and metallicities are related, the random lines of sight that intersect the CGM can therefore probe the structure of the potential well depth, and thereby trace the structure of the matter distribution in galaxies.

In this talk I will demonstrate how we can combine all the information from the absorption lines and their host galaxies emission properties to probe the structure of the dark matter halos of dwarf galaxies at intermediate to high redshifts.

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