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Quiescent carbon in the CGM of high redshift radio galaxies

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Contributed talk

Abstract:

“The circum-galactic medium (CGM) is the location where galaxies directly interact with their environment through accretion and feedback events. These reservoirs can cover scales of several 100s of kpc, and are mostly studied in the optical through bright emission lines such as Lyman-alpha tracing their ionized gas. However, these optical/near-IR observations are likely missing an important part of the picture. I will present ALMA observations of the atomic carbon line [CI] in a sample of nine radio galaxies at redshifts 2 to 4.5. While some of these show broad [CI] lines up to 1000 km/s likely powered by the central AGN, we also find several examples of intriguingly narrow 50-120 km/s [CI] lines in the haloes of these massive galaxies. We compare these with our VLT/MUSE observations of the same galaxies, showing that the narrow [CI] gas detected by ALMA is tracing at least as much gas the ionized gas. Our [CI] detections reach beyond the regions where the radio jets have stirred up the gas kinematics, and therefore seem to trace the elusive CGM gas reservoirs from which these massive galaxies are forming. Future ALMA observations of other redshifted fine structure lines (e.g. [CII]158um, [NII]122/205, [OI]63/145um, [OIII]52/88um) should open up a new diagnostics of the physical conditions (density, ionization, metallicity) in the CGM at their epoch of formation.”

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Session Classification: Cosmology