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Toby Devereaux - Star-forming clumps and their molecular gas content

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The peak of galactic star formation occurs between a redshift of 1-3. Galaxies at these redshifts are shown to be dominated by irregular clumpy morphologies. These clumps are suggested to be starbursting and are thought to play a significant role in the growth of the bulge and subsequent evolution of the galaxy itself. Despite being observed in bright UV wavelengths and optical emission lines, these star forming clumps have not been significantly detected in molecular gas observations at this redshift. As these clumps are actively star forming, it begs the question; where is the fuel (molecular gas) for star formation in these clumps? BX610 has canonically been described as a typical clumpy galaxy at the epoch of cosmic star formation ($z=2.21$). BX610 has been well observed with both SINFONI and HST probing the stellar emission, star formation and warm ionised gas, and a clumpy morphology has been found in both tracers. We present ALMA observations, at exquisite resolutions of $0.085''$ - $0.155''$ (matching the HST and SINFONI+AO observations), targeting the compact CO(4-3) and CO(7-6) line emission and dust continuum - at sufficiently high sensitivity to detect the clumps. I will present the detection of some clumps in CO, whereas other clumps remain undetected, and discuss the reasons and specific scenarios for this observation.

Session Classification: Galaxies and AGNs