## X33a SXDF-ALMA 1.5 arcmin$^2$ deep survey. A compact dusty star-forming galaxy at z=2.5.

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We present results from the SXDF-ALMA 1.5 arcmin$^2$ deep survey at 1.1 mm using Atacama Large Millimeter Array (ALMA). The map reaches a $3\sigma$ depth of 165 $\mu$Jy/beam and covers 11 H$\alpha$-selected star-forming galaxies at $z = 2.53$ and one at $z = 2.19$. We have detected continuum emission from four of our H$\alpha$-selected sample. They are all red and have stellar masses of log $(M_*/M_\odot) > 10.9$ while the other blue, main-sequence galaxies with log$(M_*/M_\odot)$=10.0-10.8 are exceedingly faint, $< 280$ $\mu$Jy ($2\sigma$ upper limit), corresponding to a gas mass of log $(M_{\rm gas}/M_\odot)$ =10.2 at $z \sim 2.5$. The non-detection raises the possibility that a conversion factor from monochromatic submillimeter luminosity to gas mass is not universal.

The 1.1 mm-brightest galaxy is associated with a compact ($R_e < 1$ kpc), dusty star-forming component. Given high gas fraction ($\sim$40%) and high star formation rate surface density (250 $M_\odot {\rm yr}^{-1}{\rm kpc}^{-2}$), the centrally-concentrated starburst can within less than 80 Myr build up a stellar surface density within the core matching that of compact quiescent galaxies at $z \sim 2$, provided 20% of the total gas is converted into stars.