

R03a CO( $J=1-0$ ) mapping survey of 64 Fornax galaxies with the ALMA Morita array

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We conduct a CO( $J=1-0$ ) mapping survey of 64 galaxies in the Fornax cluster using the ALMA Morita array. Our sample includes dwarf, spiral and elliptical galaxies with stellar masses spanning  $10^{6.3-11.6} M_{\odot}$ . CO( $J=1-0$ ) emission is detected from 22 out of the 64 galaxies. The achieved beam size and sensitivity are  $15'' \times 8''$  and  $\sim 12$  mJy beam<sup>-1</sup> at the velocity resolution of  $\sim 10$  km s<sup>-1</sup>, respectively. When we limit the sample to the 41 massive galaxies with  $> 10^9 M_{\odot}$ , we find that (1) the Fornax galaxies show a lower molecular-gas mass fraction ( $\mu_{\text{mol}}$ ) than and a comparable star-formation efficiency (SFE<sub>mol</sub>) to the field galaxies for their masses; (2) the Fornax galaxies below the main-sequence of star-forming galaxies have lower  $\mu_{\text{mol}}$  while higher SFE<sub>mol</sub> than the field galaxies; (3)  $\mu_{\text{mol}}$  of the Fornax galaxies more strongly correlates to the accretion phase to the cluster that can be defined on the phase-space diagram (lower  $\mu_{\text{mol}}$  for the more ancient infallers) than the local number density of galaxies (lower  $\mu_{\text{mol}}$  for the galaxies in the denser region). Our results suggest that the molecular gas in the massive Fornax galaxies is consumed/removed faster than the depletion timescale of molecular gas in the normal field galaxies and the processes responsible for it are more likely to be the interaction with the cluster potential or intracluster medium rather than the galaxy-galaxy interaction.