

## RESOLVED STAR FORMATION AND MOLECULAR GAS PROPERTIES OF GREEN VALLEY GALAXIES: A FIRST LOOK WITH ALMA AND MANGA

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## SDSS-MaNGA の3つのGreen Valley銀河のALMA CO(1-0)観測

- Resolution matched SF map との比較
- => SFE,  $f_{\text{gas}}$ がバルジとディスクで異なるか？

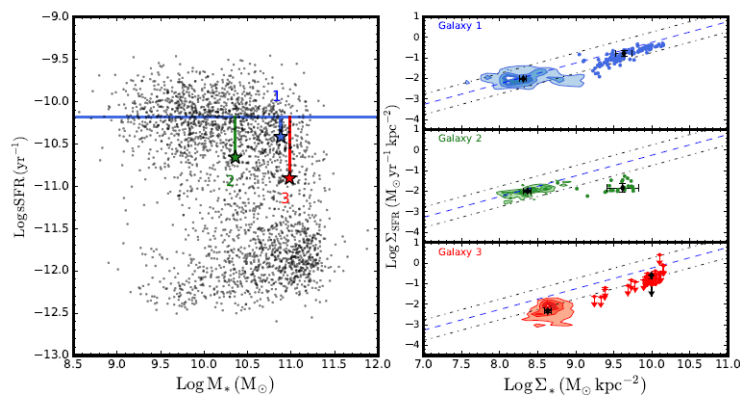


Figure 1. Left panels: The positions of the three green valley galaxies on the global sSFR versus stellar mass plane derived from the Pipe3D analysis of MaNGA

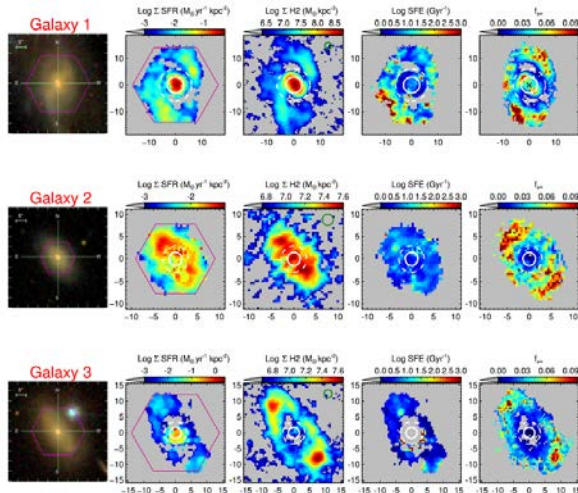


Figure 2. Maps of various quantities for the 3 green valley galaxies (from top to bottom: Galaxy 1, Galaxy 2, and Galaxy 3). The 1st column shows the SDSS  $ggr$  composite images with the MaNGA  $H\alpha$  overlaid in pink. The 2nd column displays  $\Sigma_{\text{H}\alpha}$  based on the MaNGA observations. The  $\Sigma_{\text{SFR}}$  in the central region of Galaxy 3 must be interpreted as an upper limit as its  $\text{H}_2$  emission is likely contaminated by AGN contributions. The 3rd column shows the  $\text{H}_2$  mass surface density map based on ALMA CO(1-0) observations. The 4th and last columns show the distributions of SFE and  $f_{\text{gas}}$ , respectively. In the 2nd to 5th columns, the ‘bulge’ and ‘disk’ regions are defined as those spaxels within the white solid circles and outside the dashed circles, respectively.

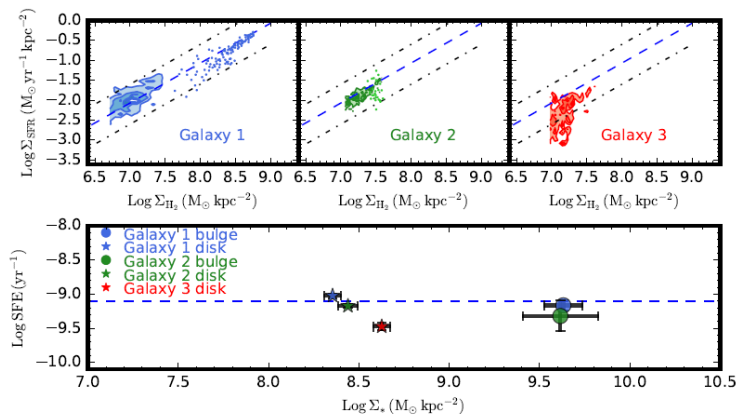


Figure 4. Top panels: The relation between the SFR surface density and the gas surface density for Galaxy 1, Galaxy 2, and Galaxy 3 (f

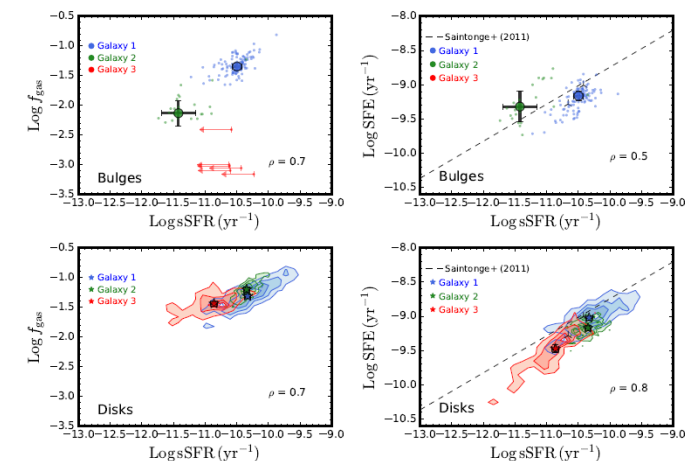


Figure 5. Left panels: The gas fraction as a function of specific star formation rate. Right panels: The star formation efficiency as a function of specific star

## 結果:

- Off-MSの銀河では、 $f_{\text{gas\_bulge}} < f_{\text{gas\_disk}}$
- $\text{SFE\_bulge} \sim \text{SFE\_disk}$
- ディスクではSFE,  $f_{\text{gas}}$ 両方ともsSFRと正の相関

## まとめると、

- バルジのsSFRは $f_{\text{gas}}$ でコントロールされる
- ディスクのsSFRは $f_{\text{gas}}$ , SFEの両方で変化する
- Inside-out quenchingを支持する
  - バルジでの星形成がガスが枯渇して先に止まる
  - 次に、 $f_{\text{gas}}$ とSFEが低下してディスクでの星形成が止まる
  - AGNフィードバックシナリオとフィットする(ただし、SFEがなぜ下がるかがわからないが)