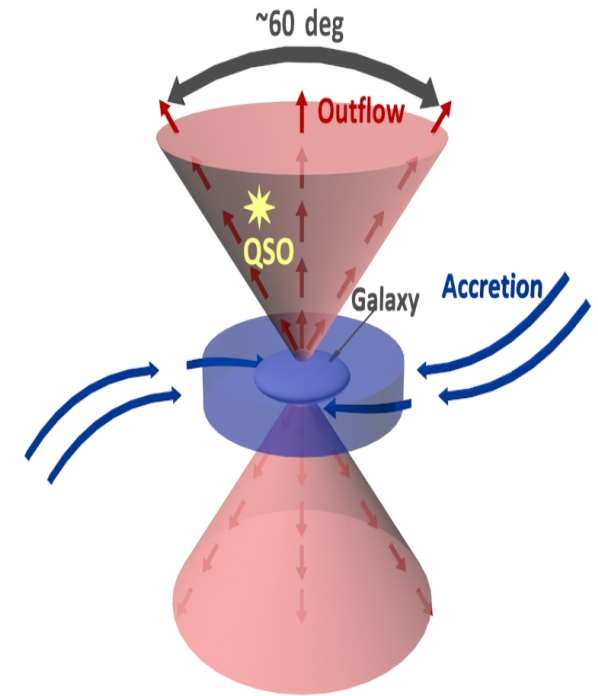


Accretion with background QSOs



‘Cold flow disks’: An emerging picture
→ ← **Do not get confused w/ cold streams**

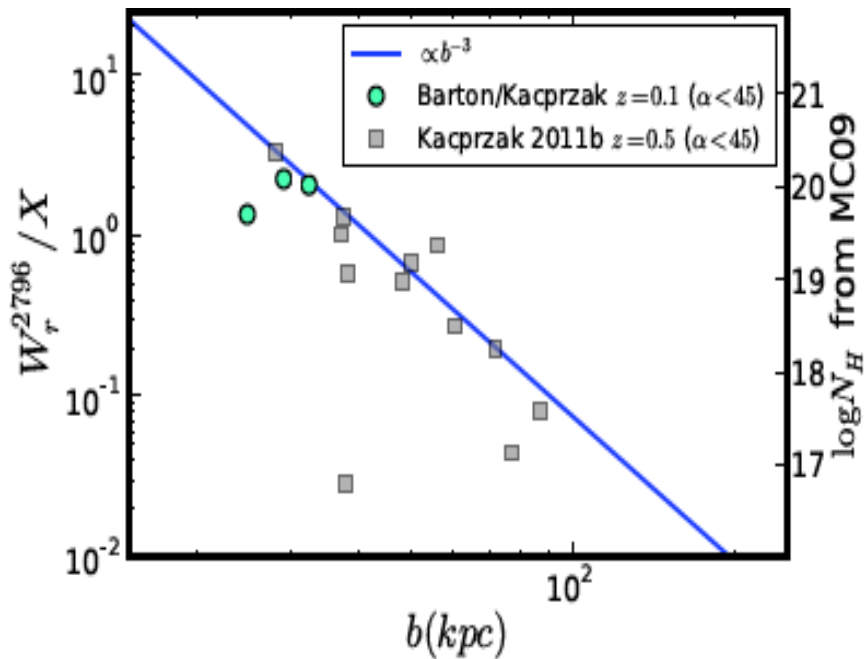
Strategy A) Radial dependence



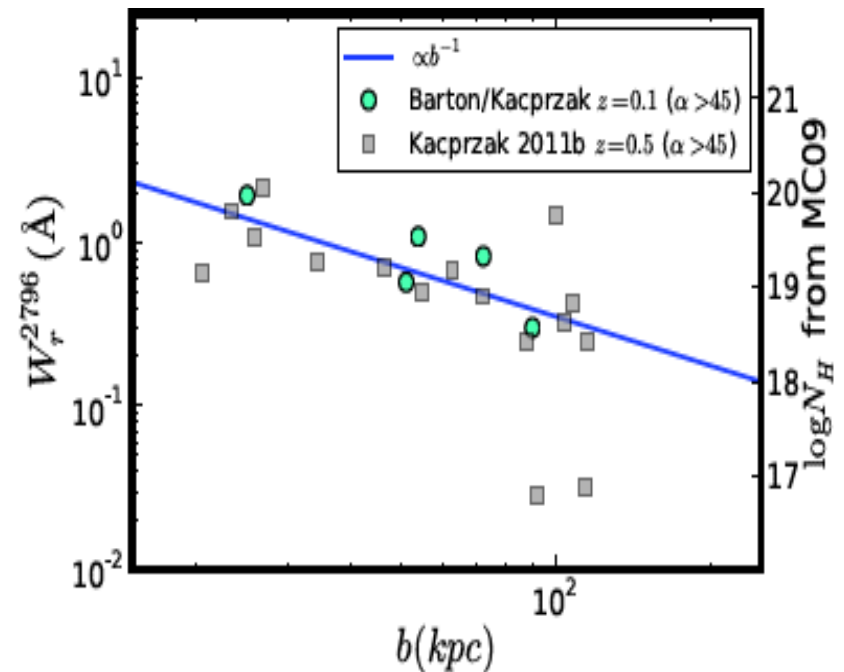
QSOAL trace both
Inflows/Outflows ! But have
different properties



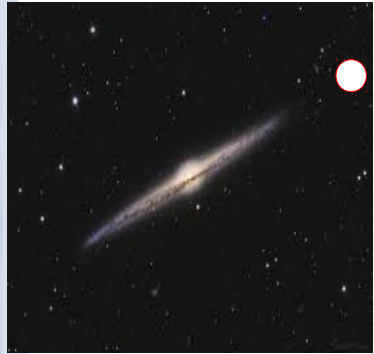
$$EW \sim b^{-3}$$



$$EW \sim b^{-1}$$



Accretion with background QSOs

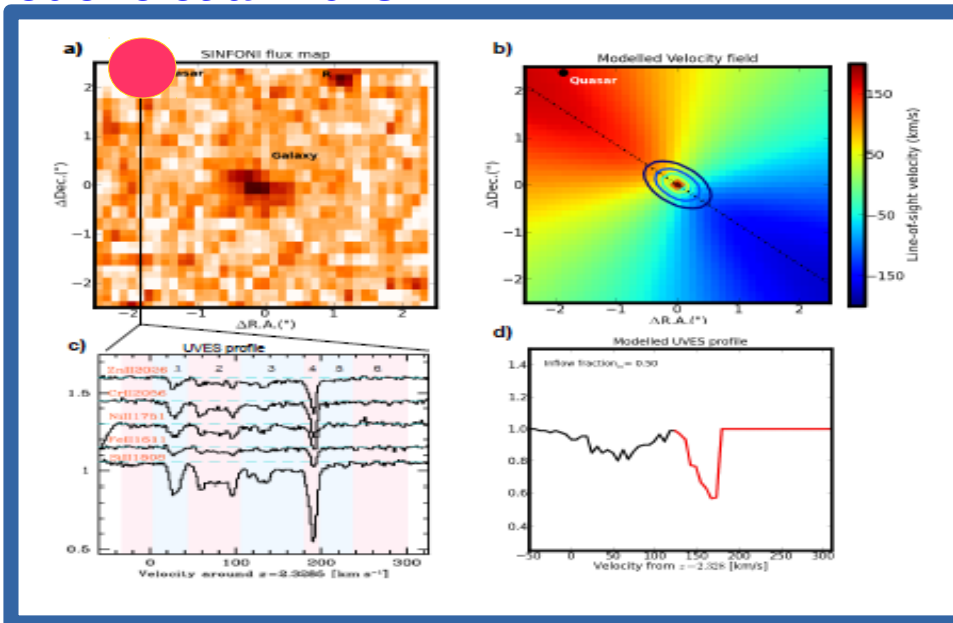


- Non-spherical distribution

Chen Tremonti 2010, **Bordoloi et al. 2011, 2014**
Bouché et al. 2012, Rubin et al. 2013,
 Lan & Ménard 2014, Nielsen et al. 2015, ...
 Schroetter et al. 2015



Bouché et al. 2013



- Spin >2 or 3 disk
- $dM_{in}/dt \sim SFR$
- **but not pristine.**

→ V_{in} , b , N_H → $dM/dt \sim SFR$!

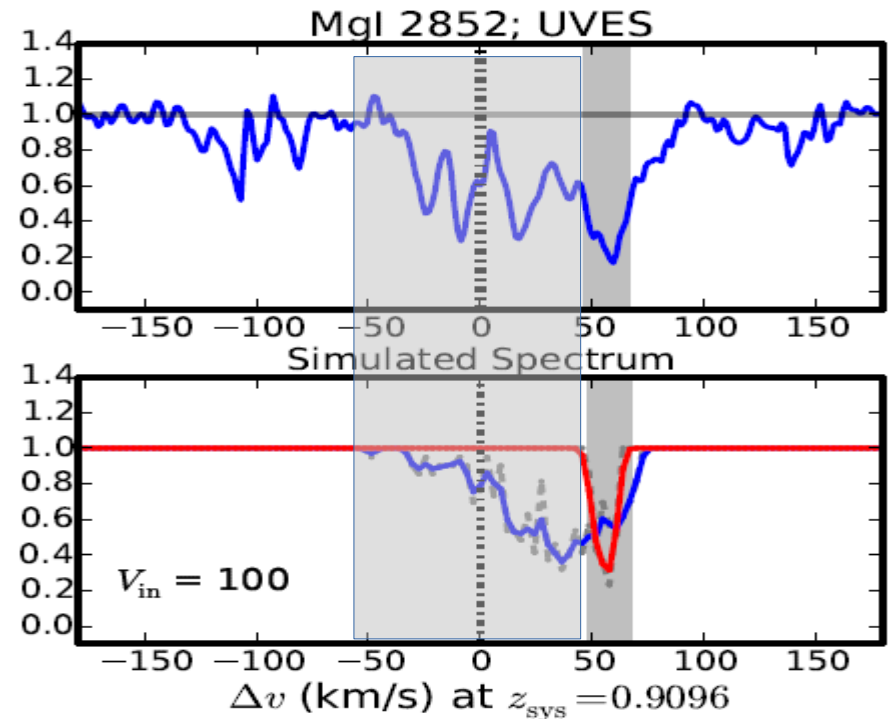
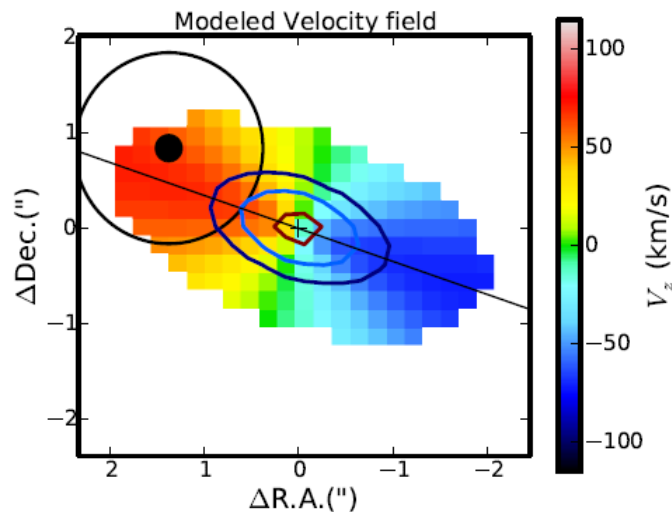
$$\dot{M}_{out}(b) = 0.41 M_{\odot} \text{ yr}^{-1} \frac{\mu}{1.5} \frac{\Omega_w}{2} \frac{N_H(b)}{10^{19} \text{ cm}^2} \frac{V_{out}}{200 \text{ km s}^{-1}} \frac{b}{25 \text{ kpc}}$$

Another accretion?

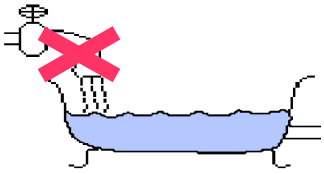
Results from MUSE & SINFONI

Bouché et al. 2015

- SFR = 3 M/yr
- $dM_{\text{out}}/dt \sim 0.5\text{-}5$ M/yr
- $dM_{\text{in}}/dt \sim 5\text{--}15$ M/yr
- Zn, etc.. +HI : **Z = -0.3**



See also
Martin et al. 2015, Nature

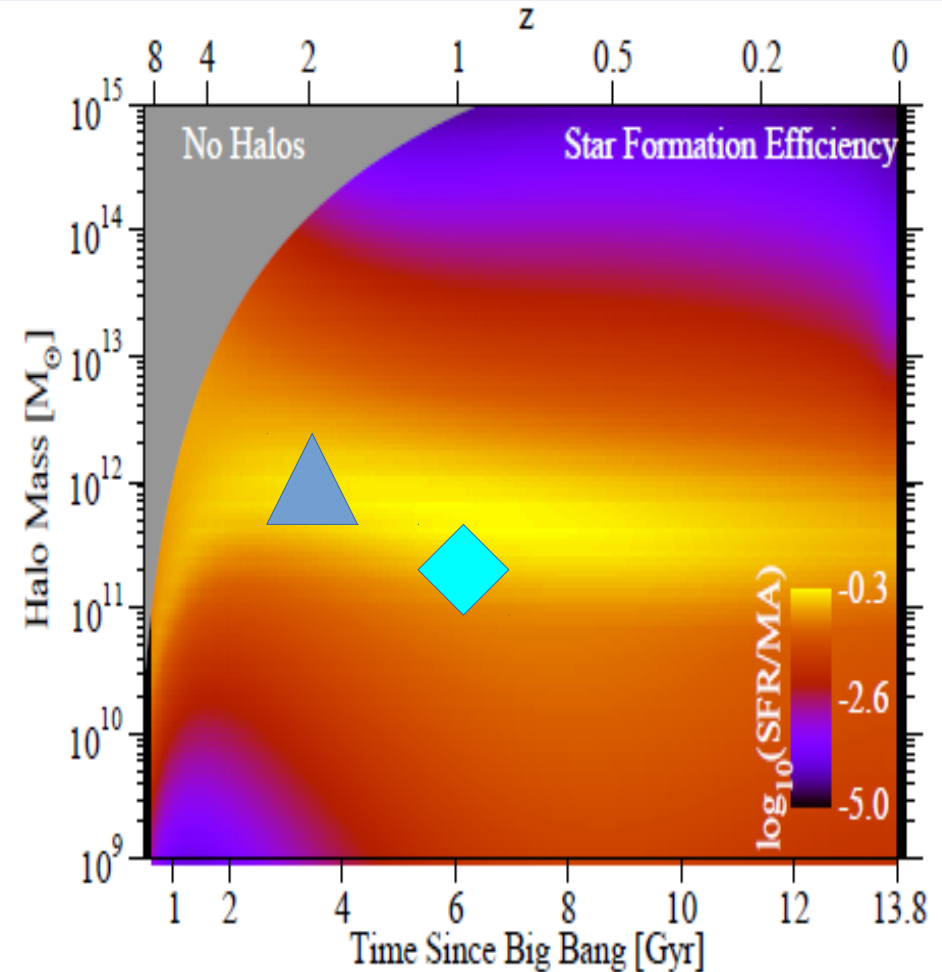
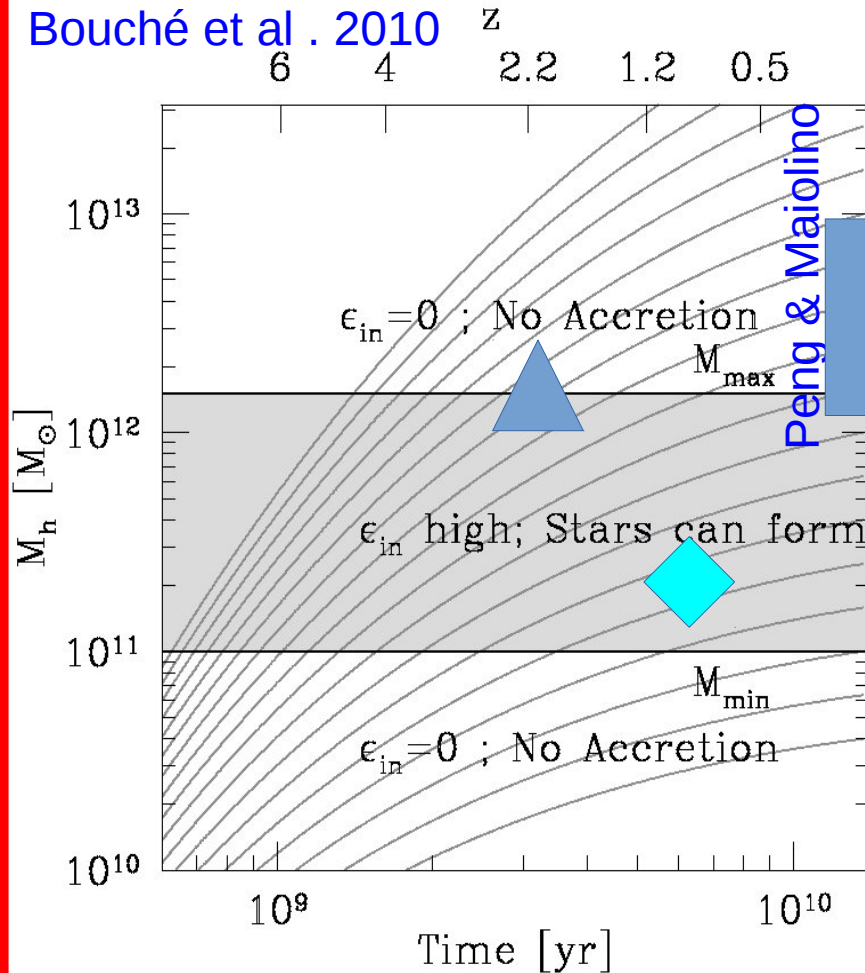


Accretion Efficiency ?

$$\text{SFR} \approx \frac{\epsilon_{\text{in}} f_B}{1 + R + \eta} \dot{M}_{\text{DM}}$$

Behroozi, Wechsler, Conroy. 2013

Bouché et al. 2010



Too steep for feedback ?