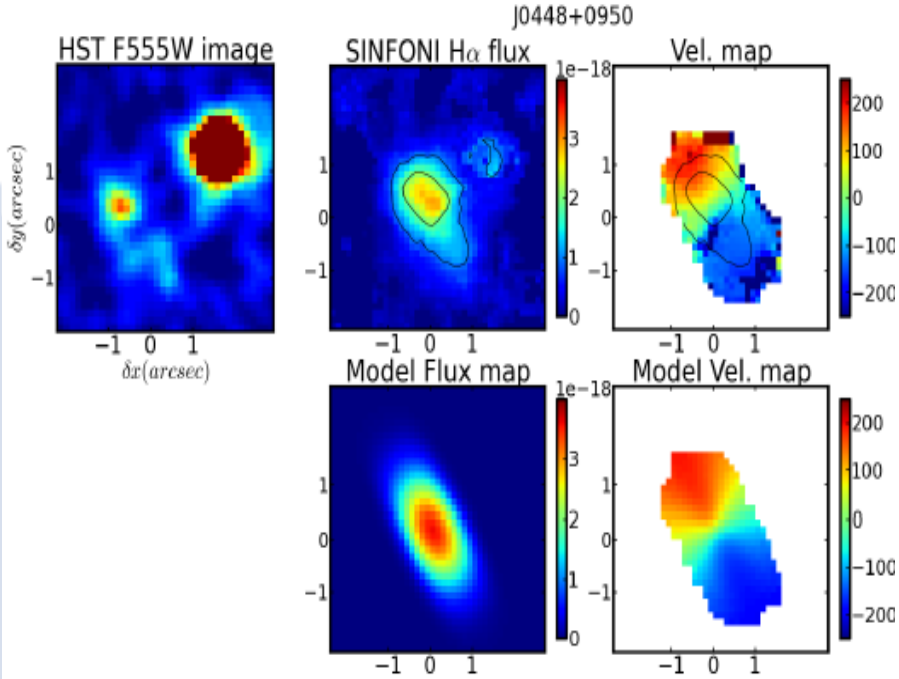
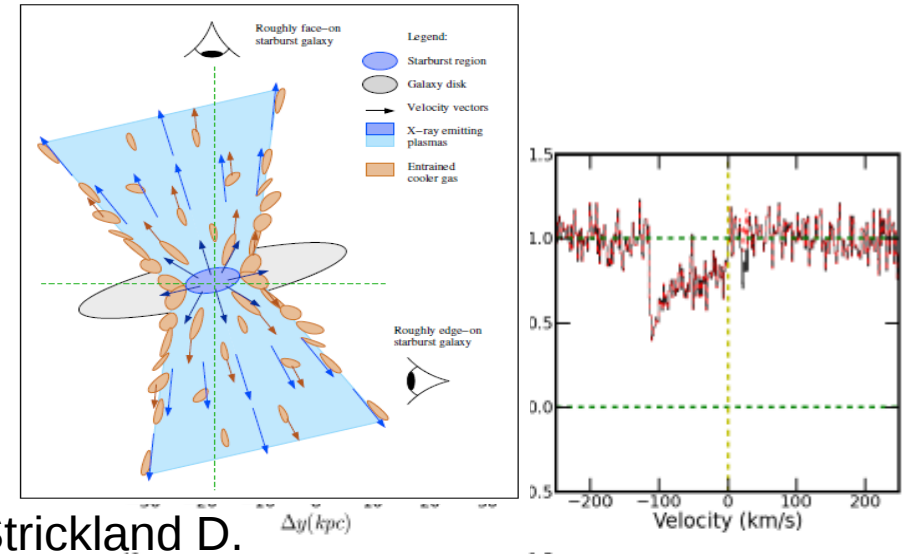
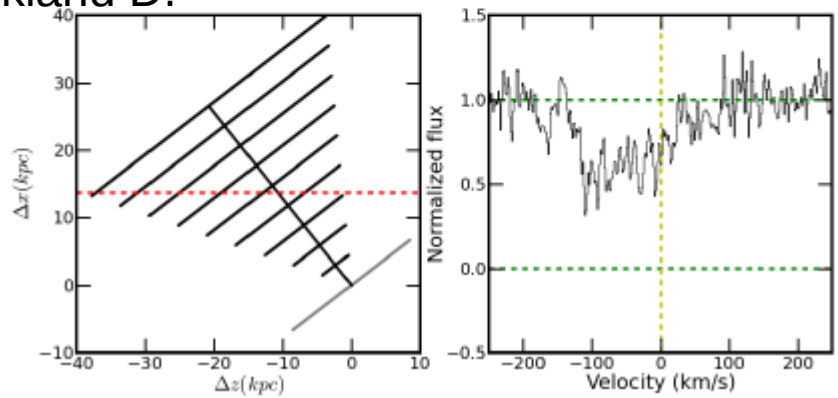
Outflows from background QSOs





Strickland D.



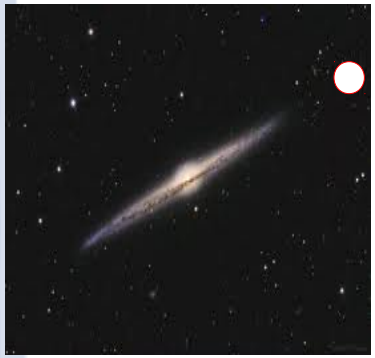
< Vesc

Schroetter et al. 2015

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

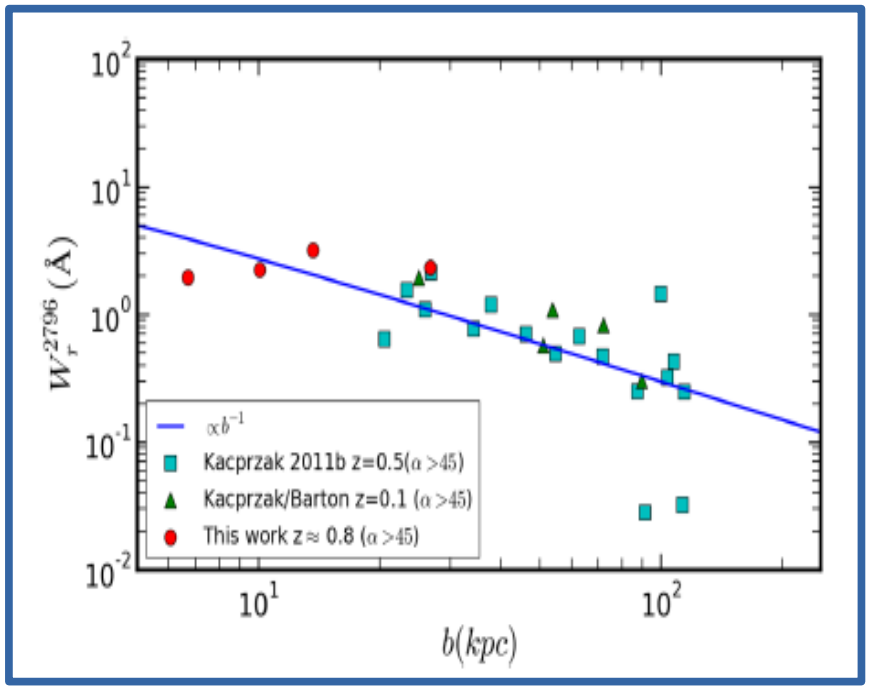
Winds with background QSOs

The most accurate dMout/dt

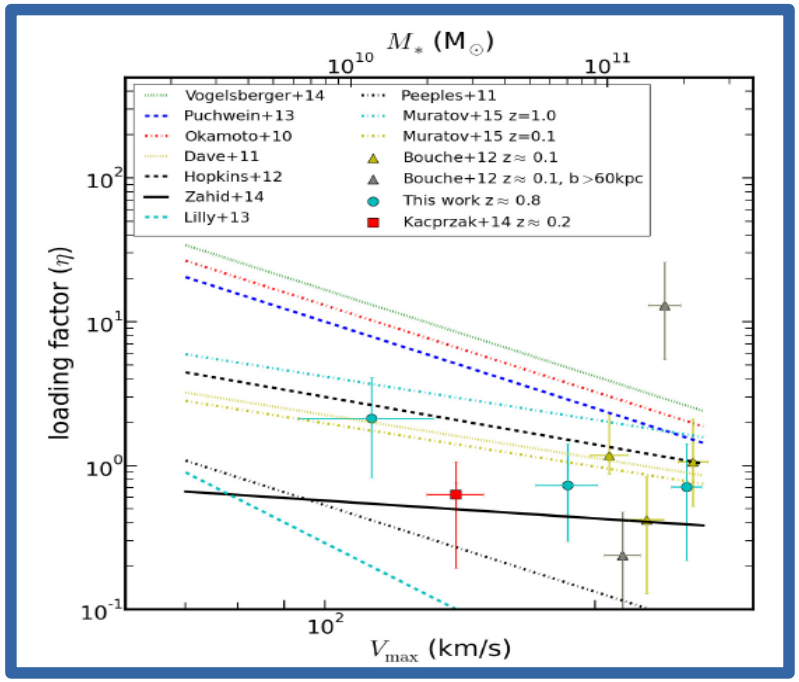


- Non-spherical distribution

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



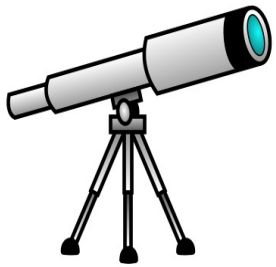
Schroetter et al. 2015

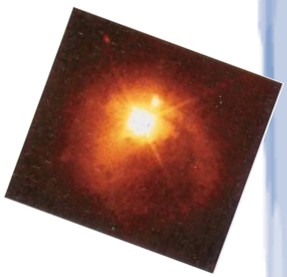


$$\dot{M}_{\rm out}(b) = 0.41 {\rm M}_\odot\ {\rm yr}^{-1} \frac{\mu}{1.5} \frac{\Omega_w}{2} \frac{N_H(b)}{10^{19} {\rm cm}^2} \frac{V_{\rm out}}{200 {\rm km\ s}^{-1}} \frac{b}{25\ {\rm kpc}}$$

« Galactic winds : How do we find out? »

Outflows from background QSOs





- Does wind escape ? NO
- Acceleration within 5 kpc
- How far do they travel ? b^{-1} up to 100 kpc
- Does wind carry enough mass?

$$\eta \equiv \dot{M}_{\rm out}/{\rm SFR} \sim V^{-1 \text{ or } -2 \text{ or } -4}$$

Stay tuned !

- If winds do not remove baryons, where are they ?