Fantastic AGN outflows and where to find them
SUPER survey

Presented by:

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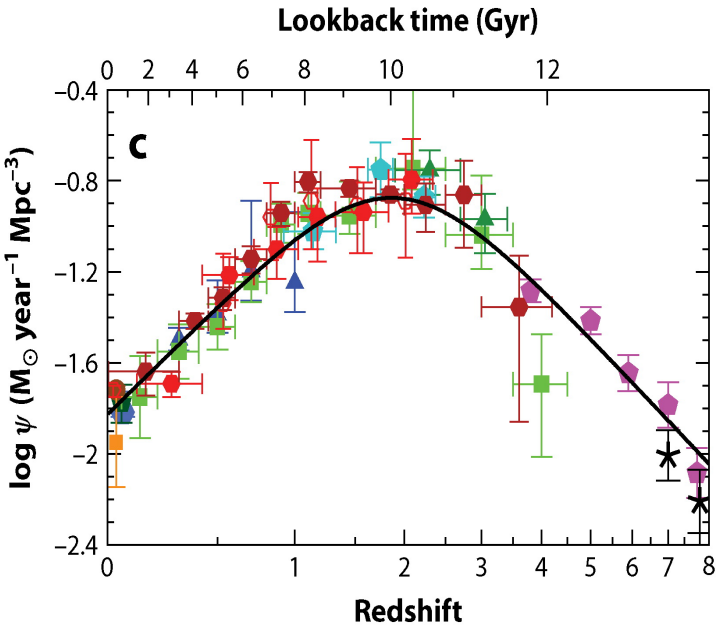
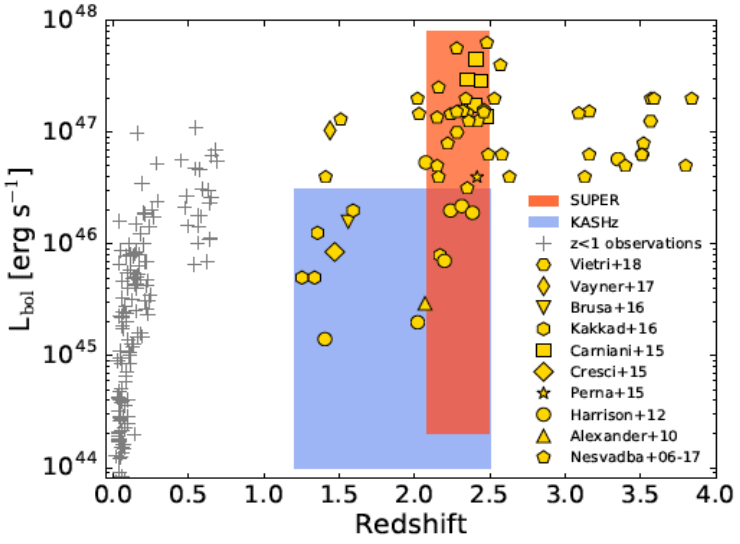
ESO fellow
in collaboration with
The SUPER team

Why SUPER survey?

PI: Vincenzo Mainieri



Madau & Dickinson 2014

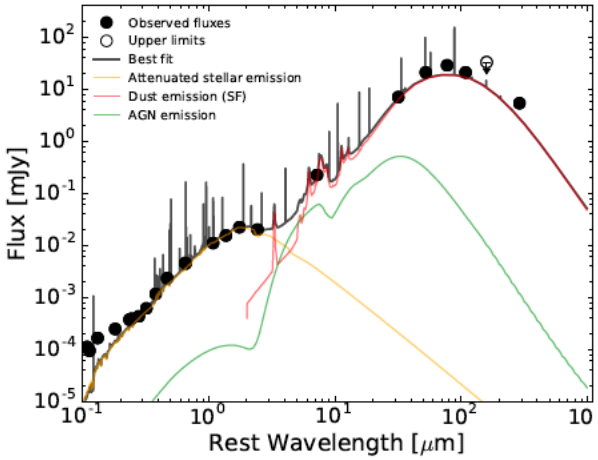


Circosta et al. (2018)

- z = 2.1-2.5
- AGN outflows across wide range of L_{bol} -> [OIII]5007
- Impact on star formation -> Hα
- Impact on molecular gas -> CO(3-2)

SUPER Sample

Chiara Circosta



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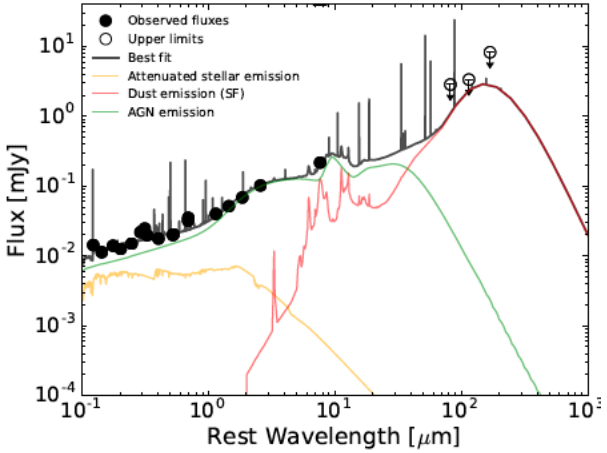
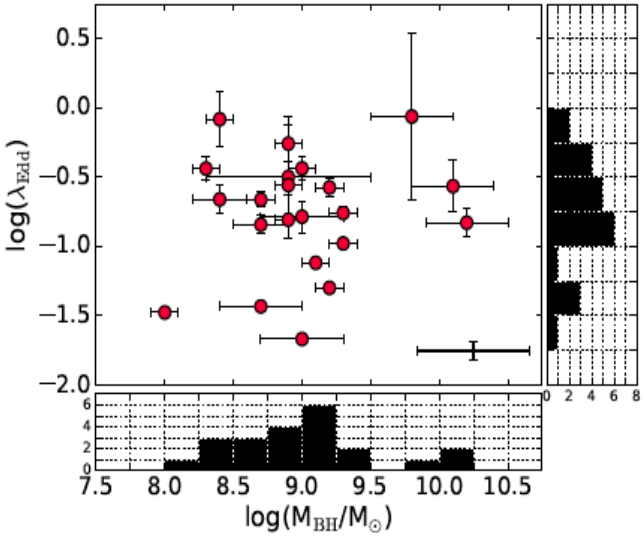
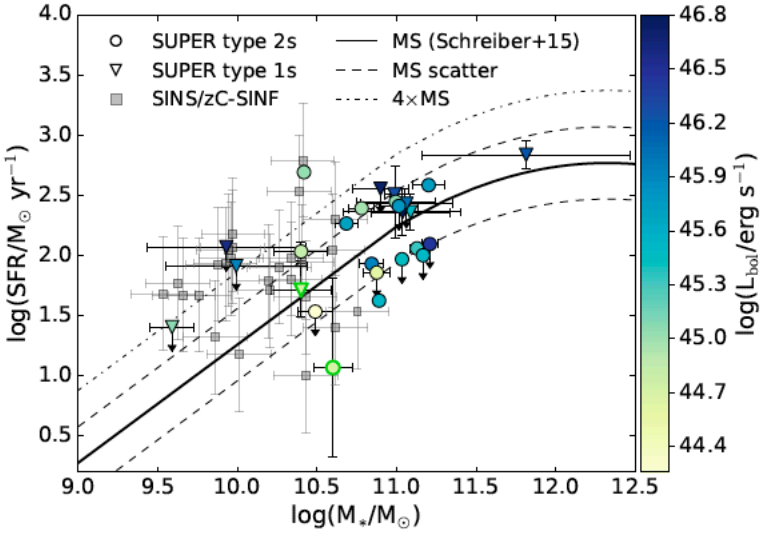


Type 1

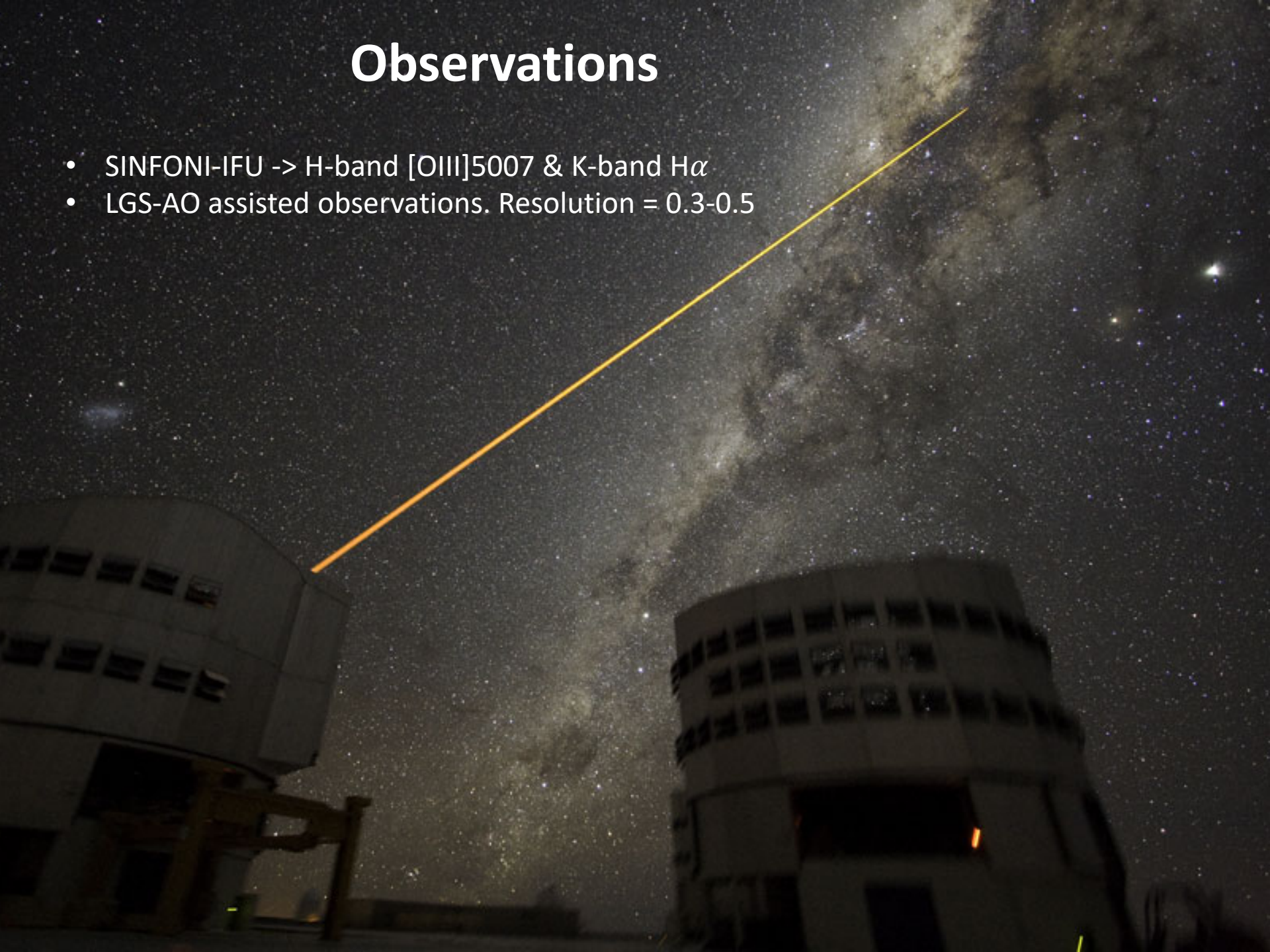




Circosta et al. (2018)

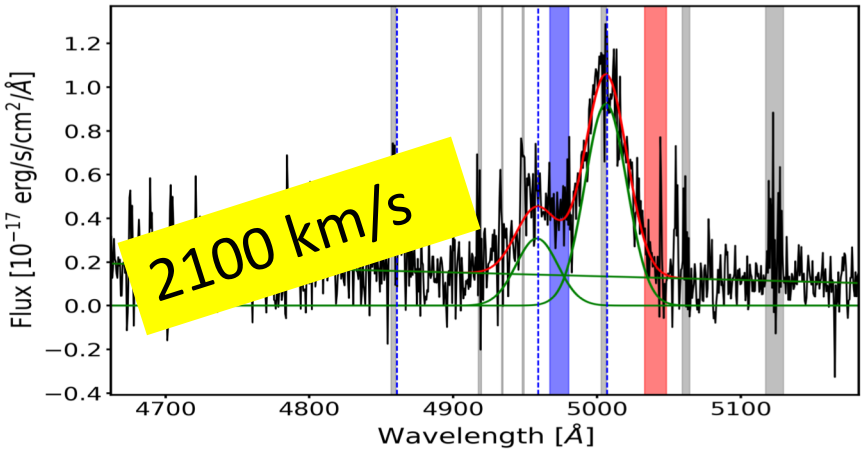
Observations

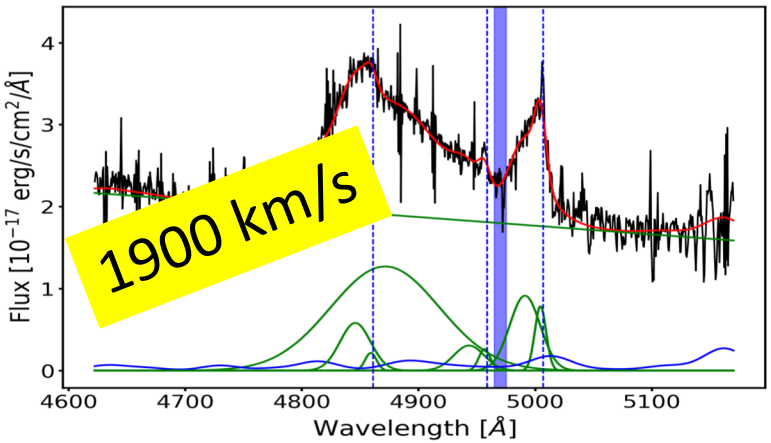
- SINFONI-IFU -> H-band [OIII]5007 & K-band Hα
- LGS-AO assisted observations. Resolution = 0.3-0.5

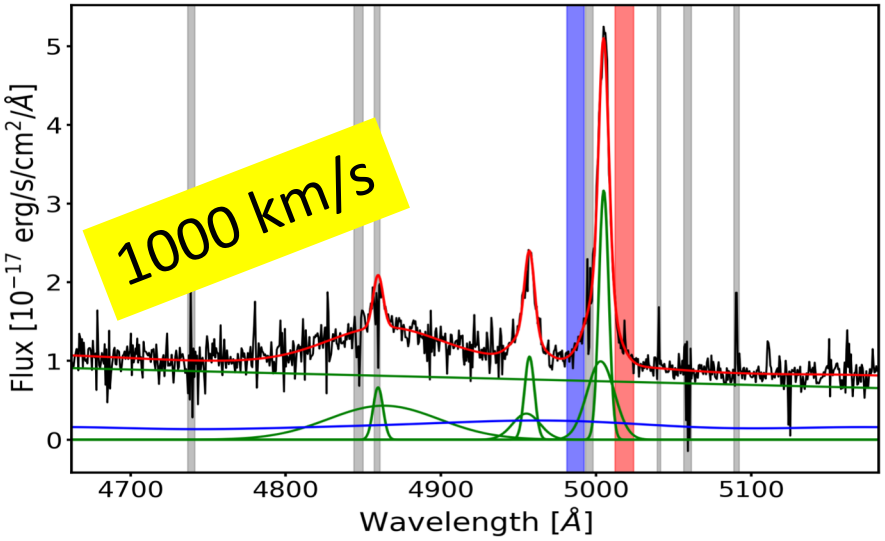


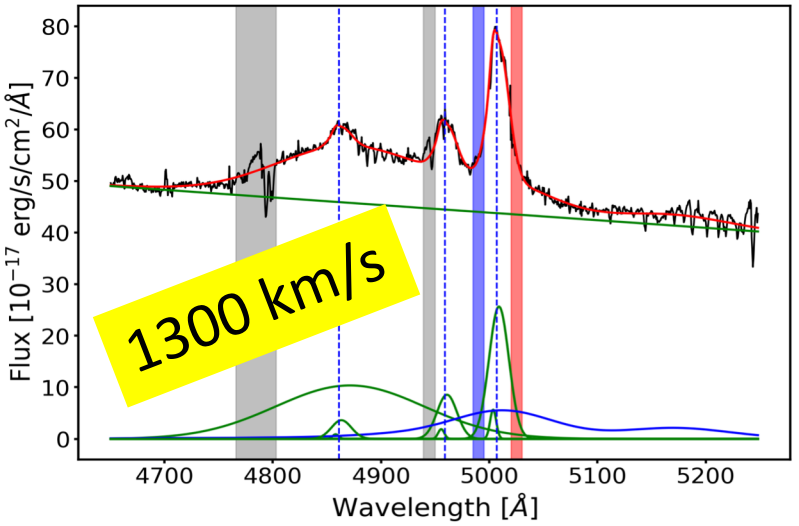
FWHM

SINFONI spectra

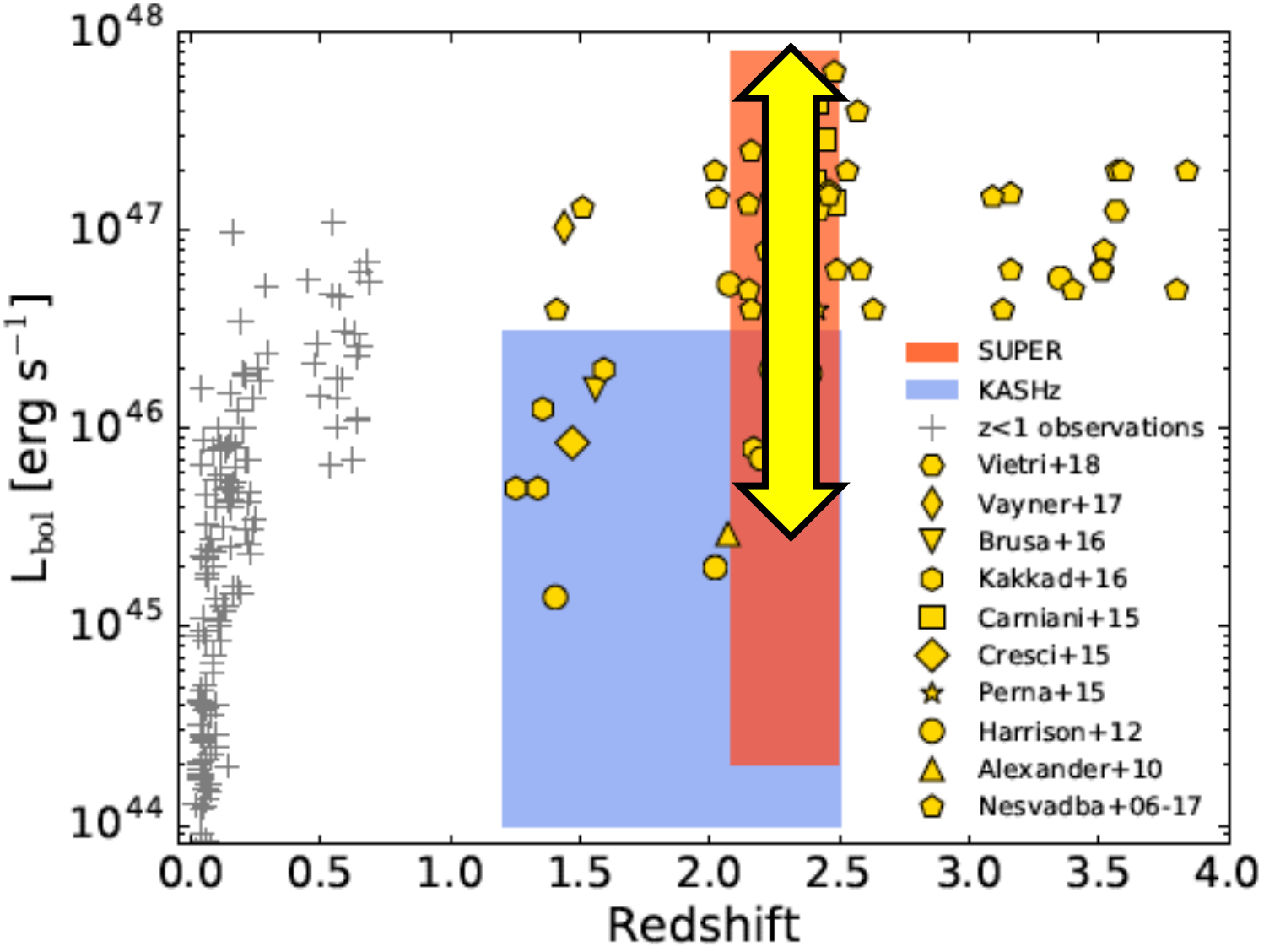




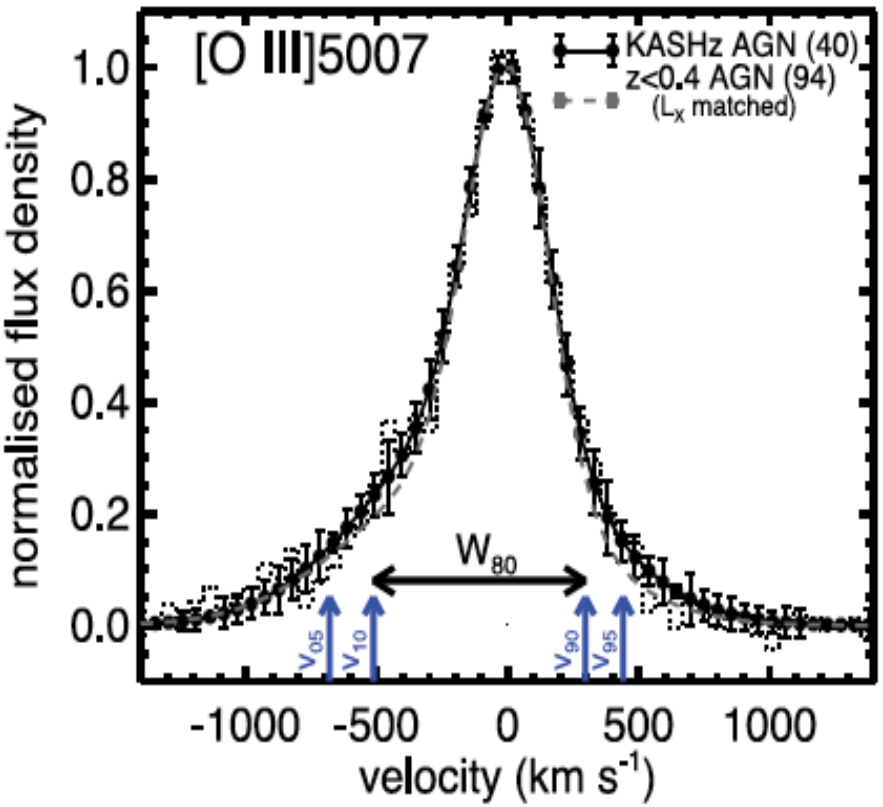




Kakkad et al. (in prep)

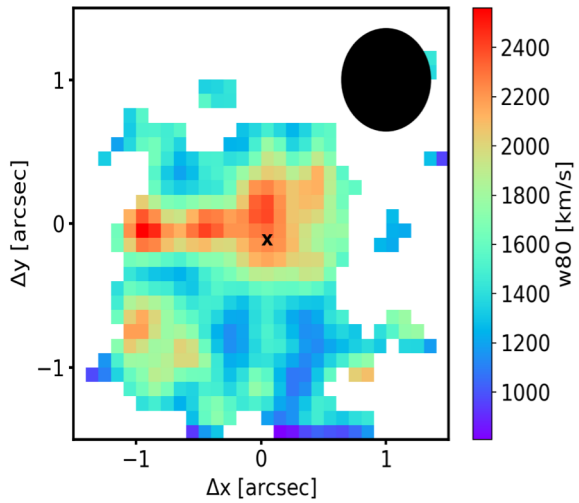

10^{48}
10^{47}
10^{46}
10^{45}
10^{44}
L_{bol} [erg s^{-1}]
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
Redshift
SUPER
KASHz
z<1 observations
Vietri+18
Vayner+17
Brusa+16
Kakkad+16
Carniani+15
Cresci+15
Perna+15
Harrison+12
Alexander+10
Nesvadba+06-17

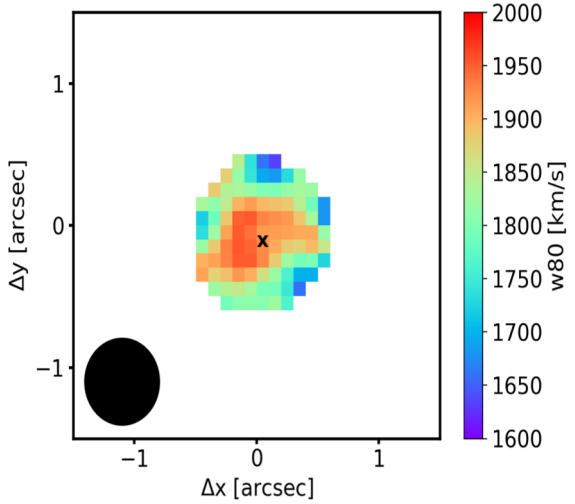
Non-parameteric definition of velocity

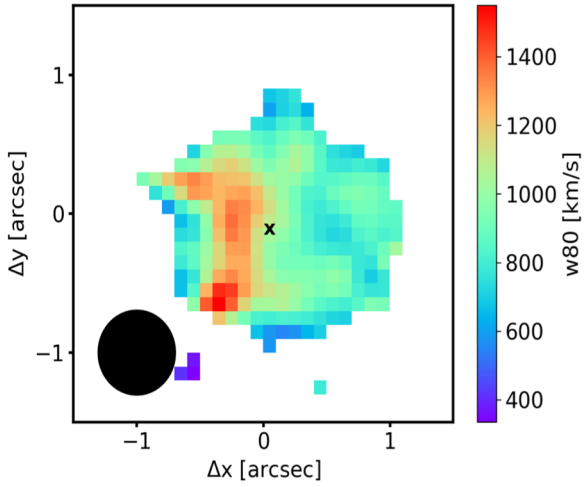


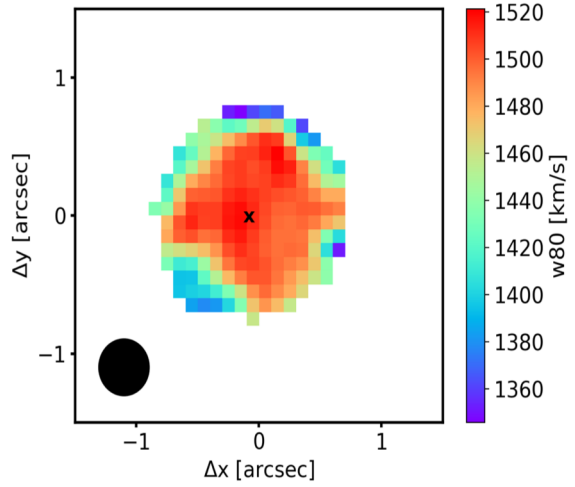
KASHz- Harrison et al. (2016)

Velocity maps





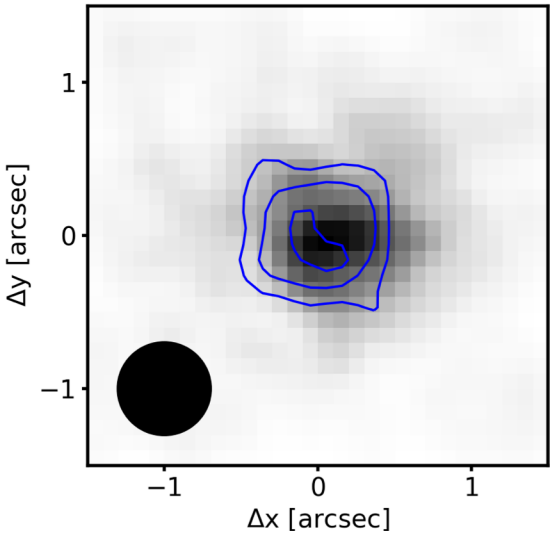


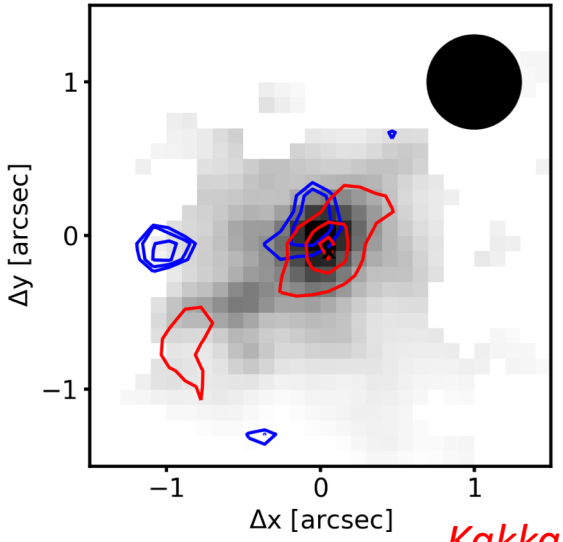


Kakkad et al. (in prep)

Beam smearing -> B. Husemann talk

Impact on Star Formation?





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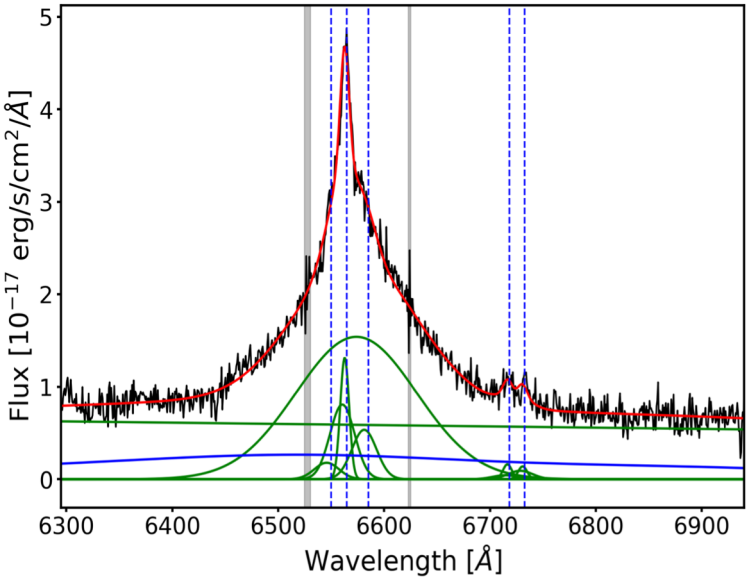
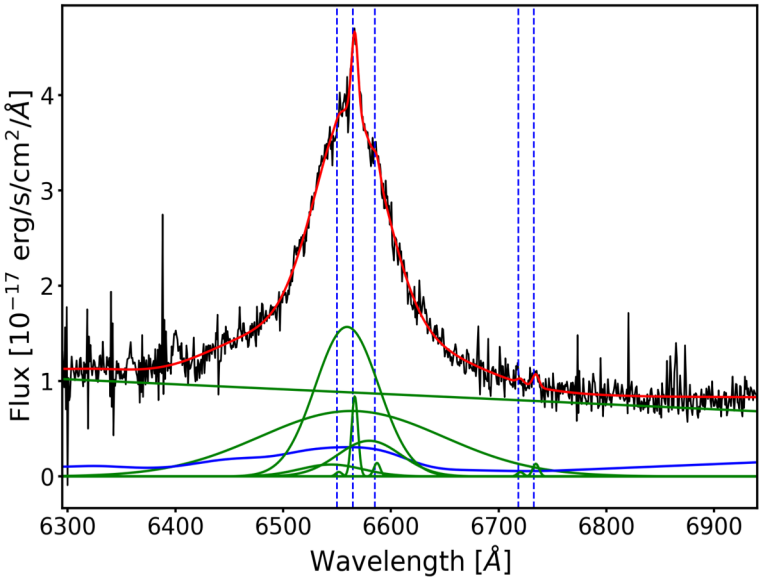
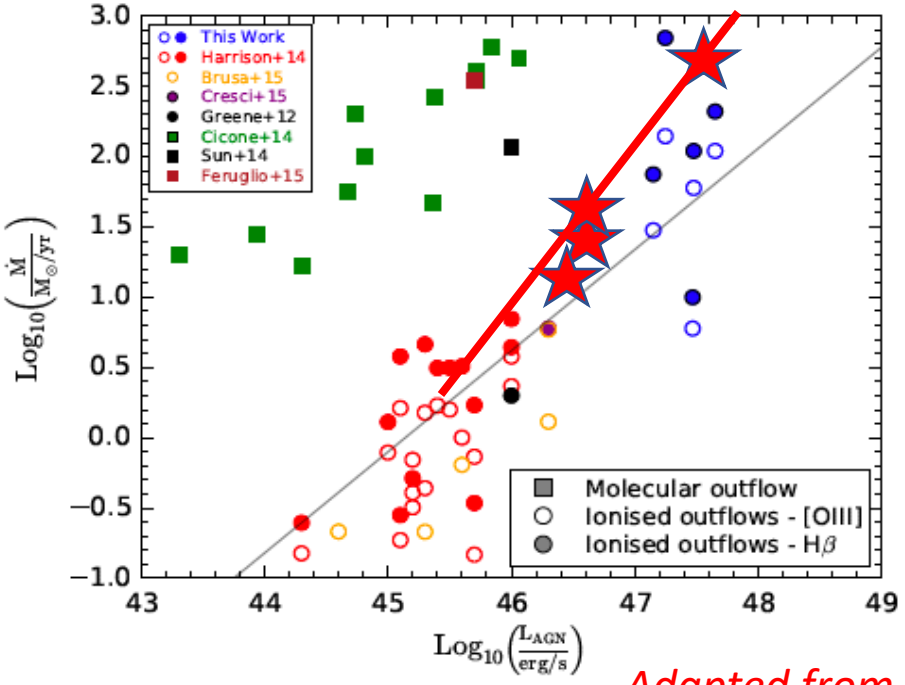




Outflow energy



Adapted from Carniani+ 2015

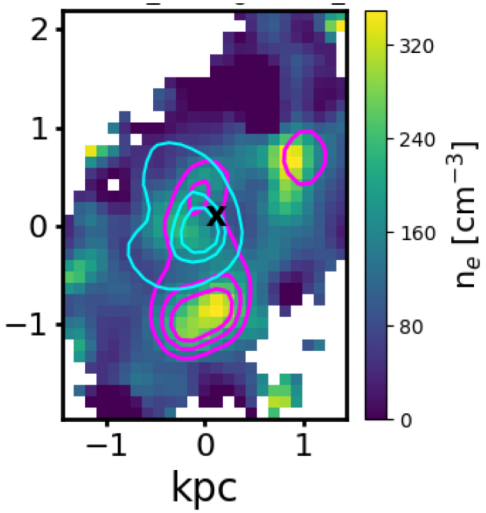
Ionized outflow traces a fraction of gas -> Probably not for all AGNs

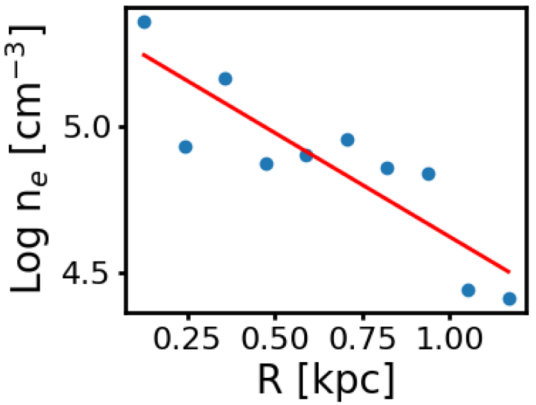
See also Fiore et al. (2017)

Electron densities

Narrow component

n_e = <50-300 cm^{-3}

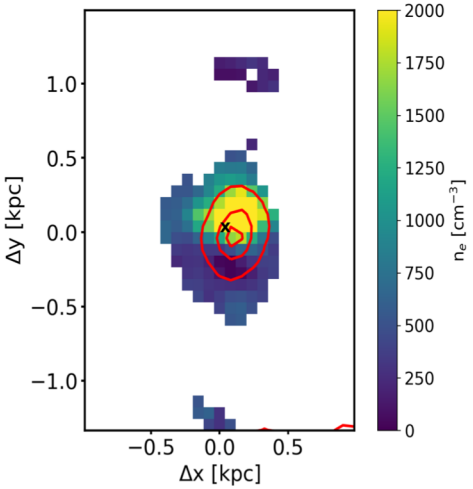


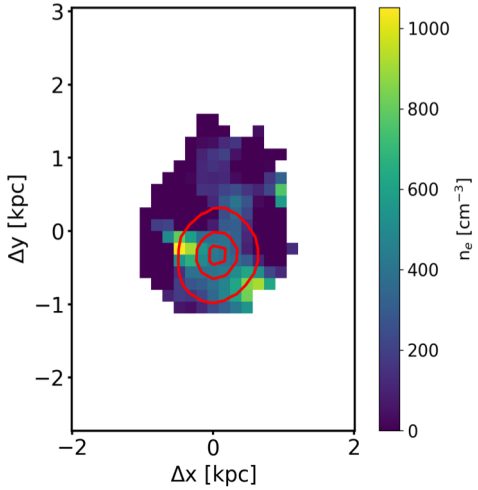


Broad component

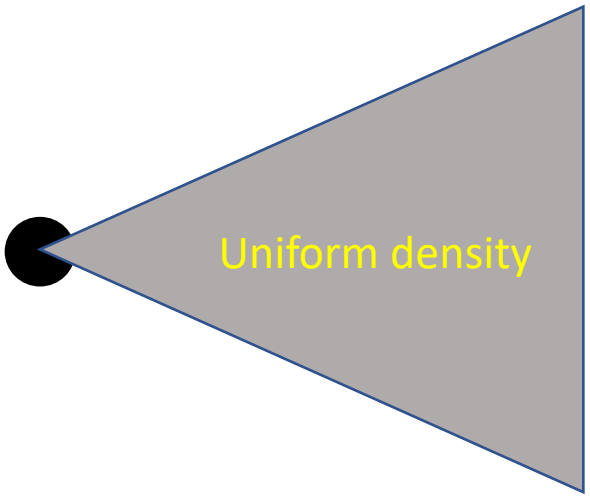
n_e = <50-2000 cm^{-3}

Kakkad et al. (2018)

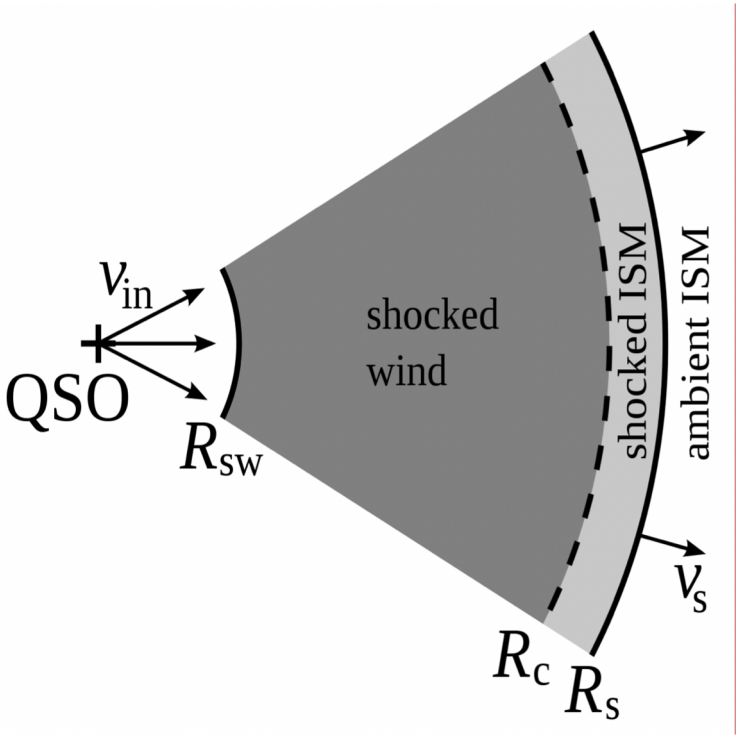




R. Davies talk, Perna et al. (2017) -> Densities in outflowing component ~ 1000 cm^{-3}



Usually assumed



Richings & FG 2017

CO(3-2) follow-up of SUPER targets -> ALMA Band 3

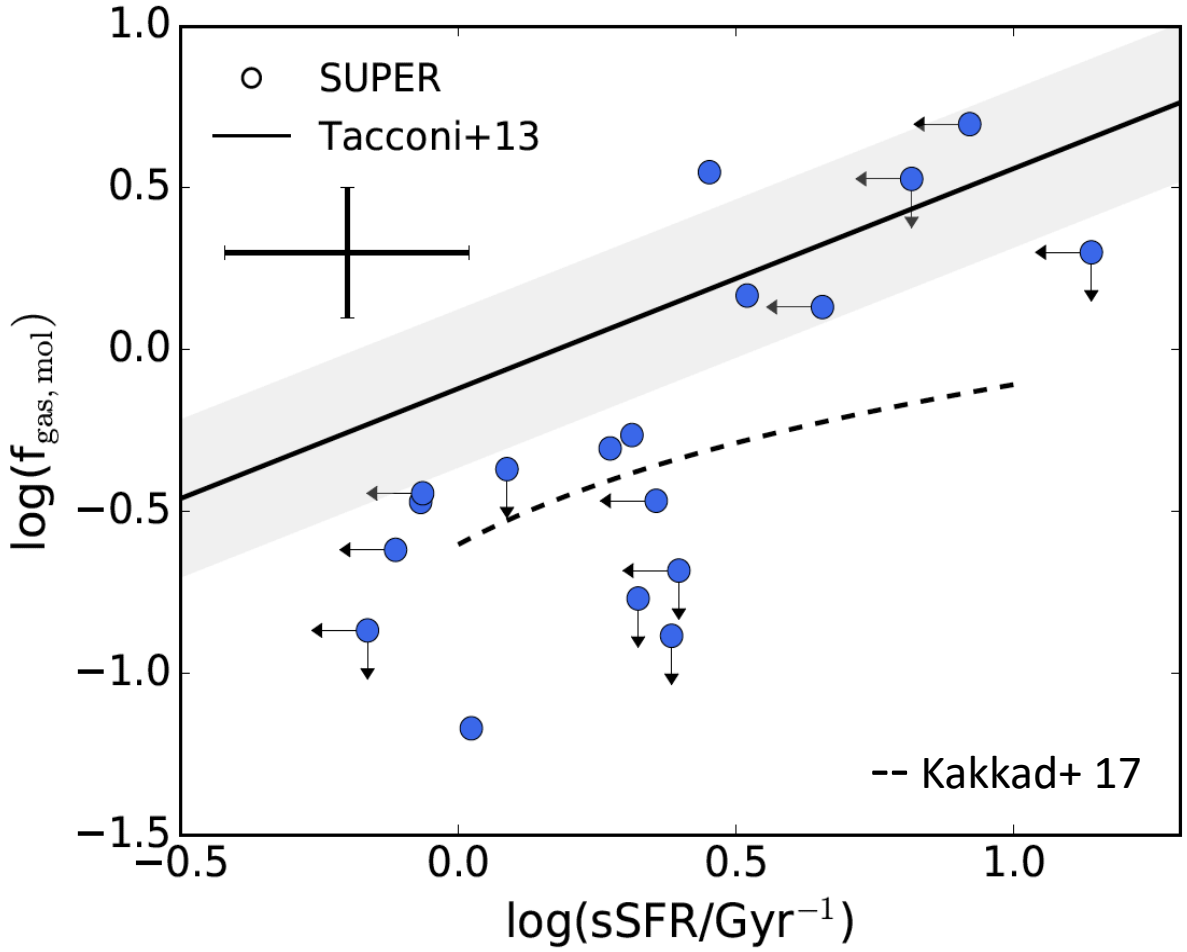
CO(3-2)

↓

L'_{CO}

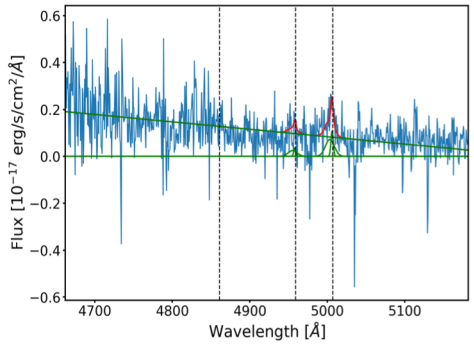
↓ α_{CO}

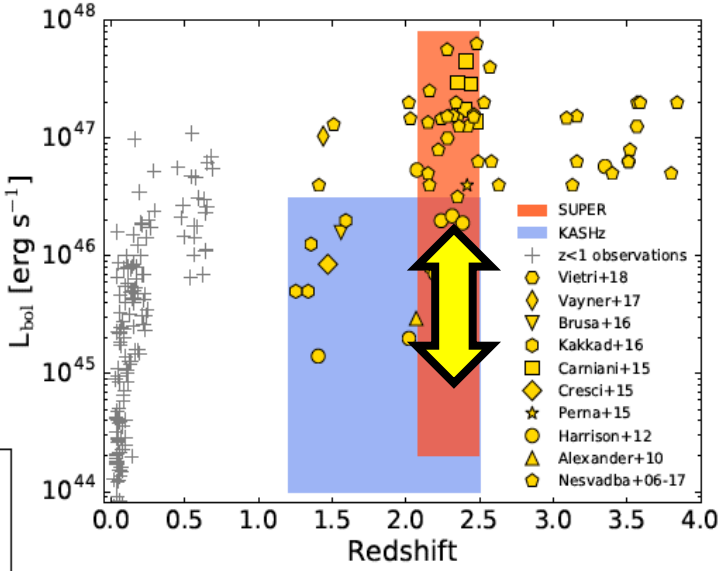
M_{H2}



Circosta et al. (in prep)

David Rosario talk


Flux [10^{-17} erg/s/cm^2/Å]
Wavelength [Å]


L_{bol} [erg s^{-1}]
Redshift
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KASHz
z<1 observations
Vietri+18
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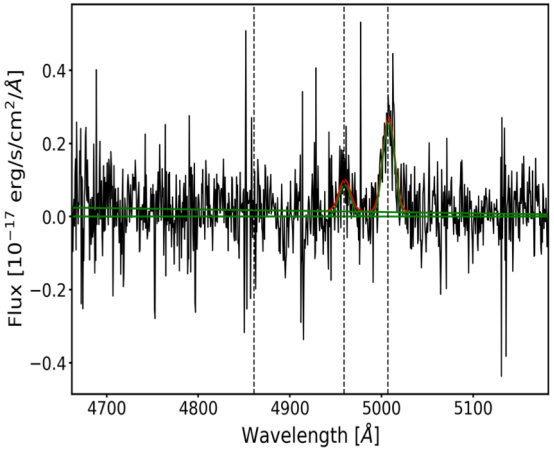
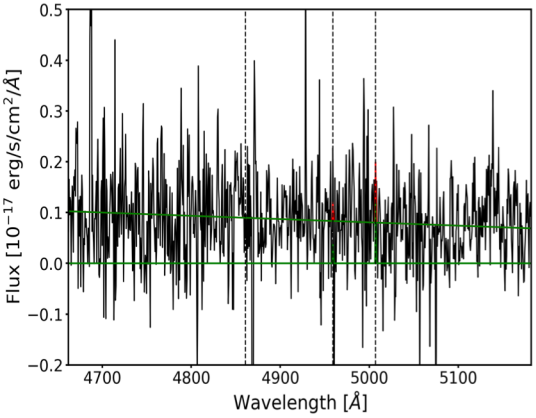
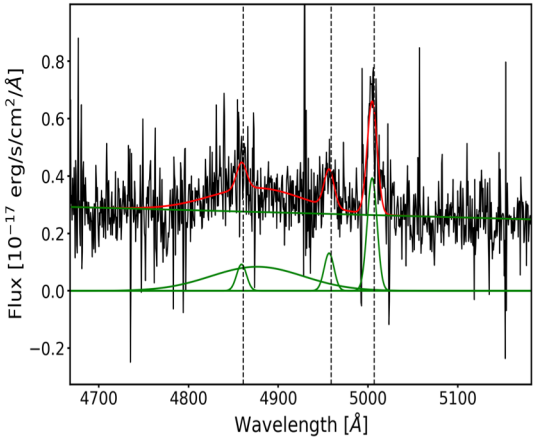
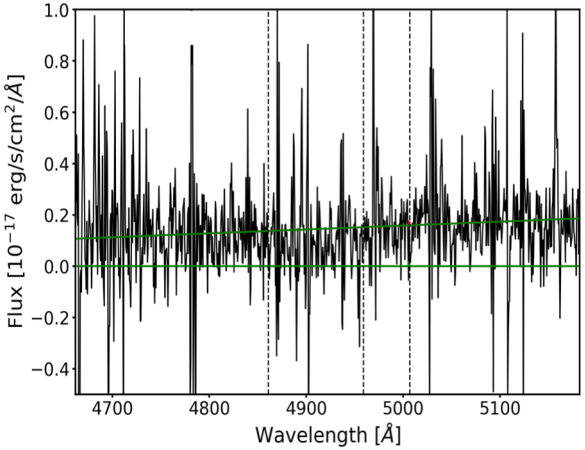
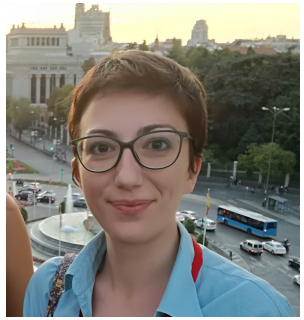

Flux [10^{-17} erg/s/cm^2/Å]
Wavelength [Å]


Flux [10^{-17} erg/s/cm^2/Å]
Wavelength [Å]

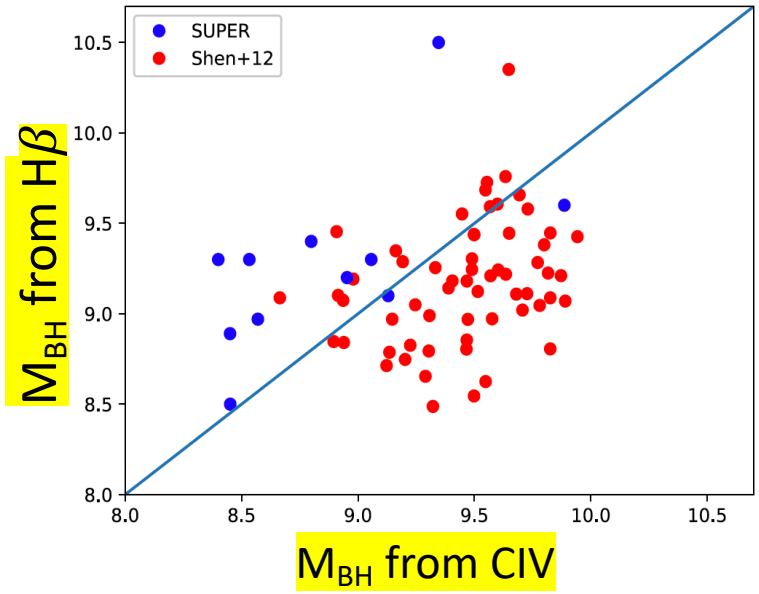

Flux [10^{-17} erg/s/cm^2/Å]
Wavelength [Å]

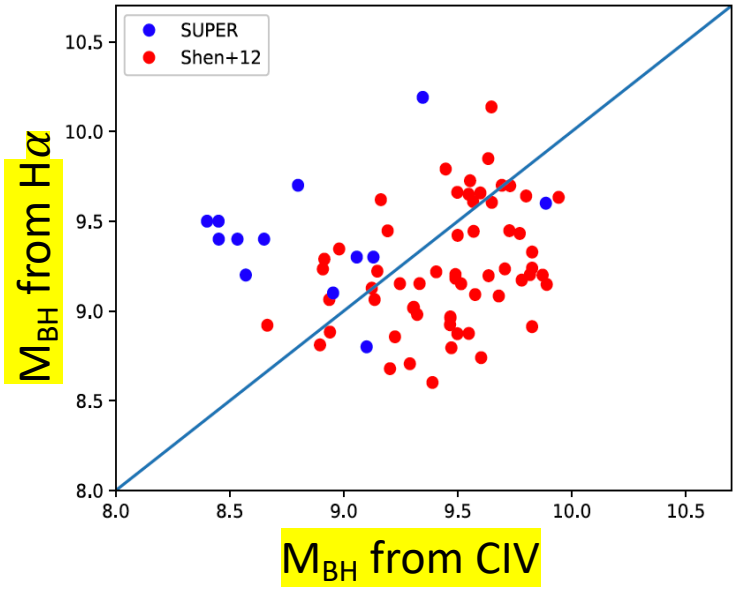

Flux [10^{-17} erg/s/cm^2/Å]
Wavelength [Å]

Black hole mass -> CIV, Hα, Hβ



Giustina Vietri

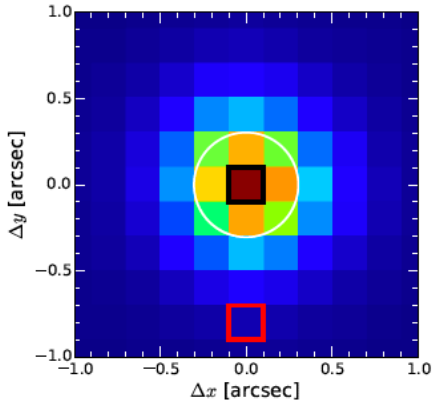


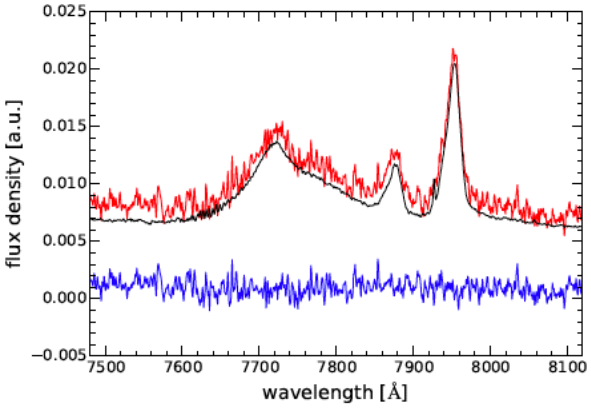


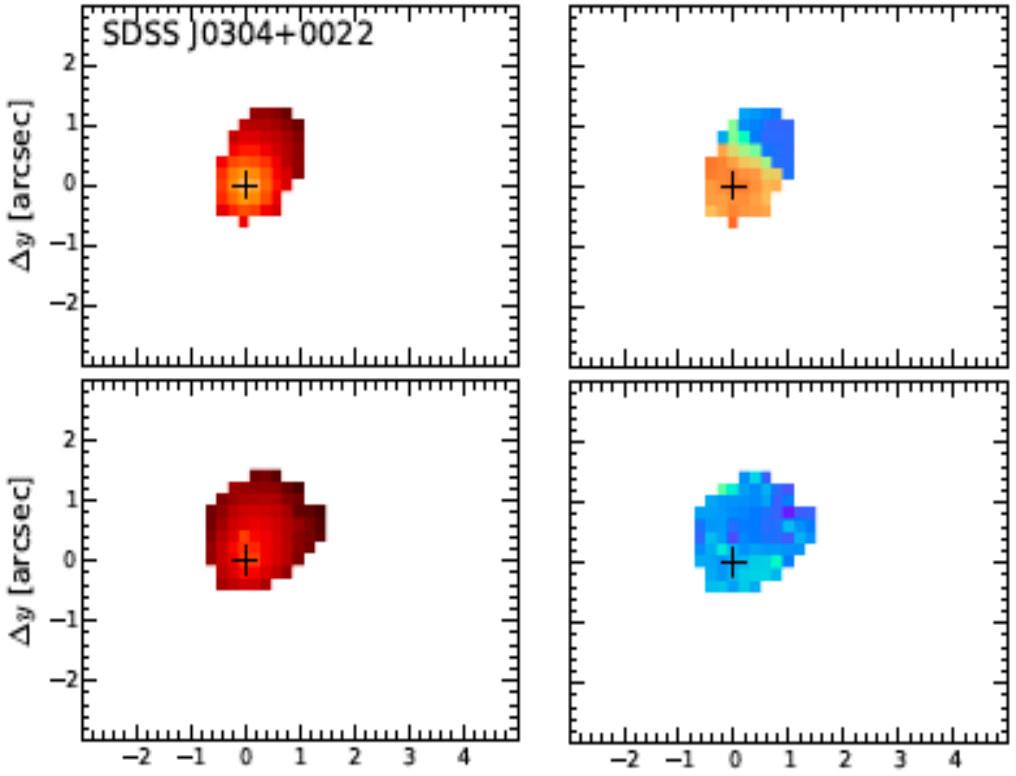
Vietri et al. (in prep)

Beam Smearing

B. Husemann







Husemann et al. (2016)