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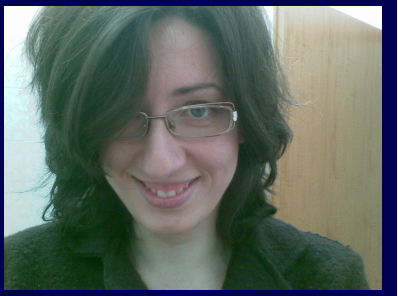


ISM ABSORPTION LINES AS OUTFLOWS TRACERS: A COMPARISON BETWEEN AGN AND SFGs

VUDS | VIMOS Ultra Deep Survey

Athens
4–8 July 2016

Large scale gas outflows

WHAT? Large-scale gas flows moving out from galaxies.

Starburst-driven

→ Massive stars end their lives exploding like Supernovae

→ The explosion causes a *shock* in the sorrounding ISM

AGN-driven

→ Much of the energy released during accretion may be tapped to drive a galactic wind; this can occur through several processes not yet well understood

→ An expanding *shell* of perturbated gas forms

→ The *bubble* may succeed in getting the gas into the IGM

WHY?
- IGM metal enrichment
- Influence on the chemical evolution of the host galaxy
- Sudden Star Formation quenching

HOW?
- ...

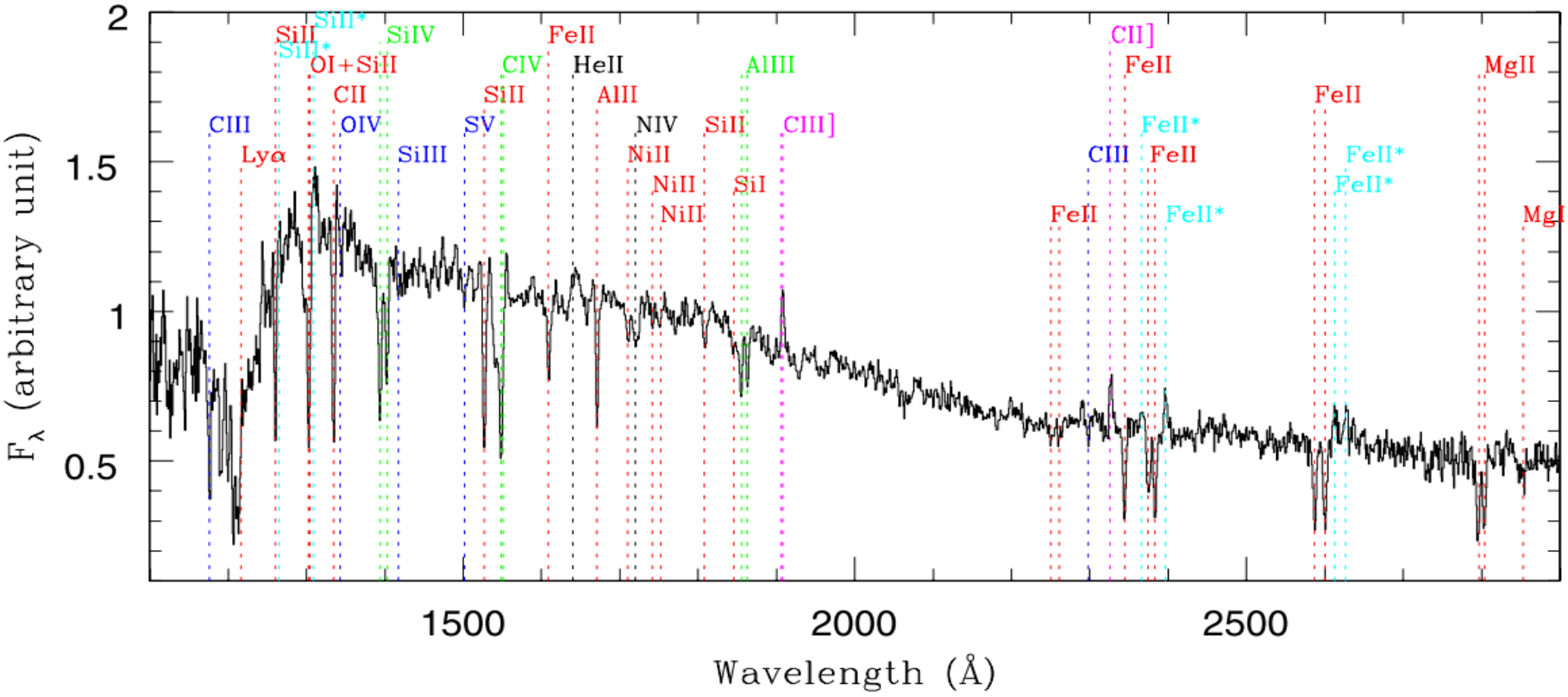
CO & [CII] emission lines (molecular phase) [e.g. Cicone+'14]

Optical emission lines (ionized phase) [e.g. Brusa+'15, Perna+'15, Cicone+'16]

UV absorption lines (neutral phase)

[e.g. Shapley+'03, Hainline+'11, Talia+'12, Cimatti+'13]

Stacked spectrum of 74 SFGs at z=2 — Talia et al. 2012



Stellar photospheric absorption lines

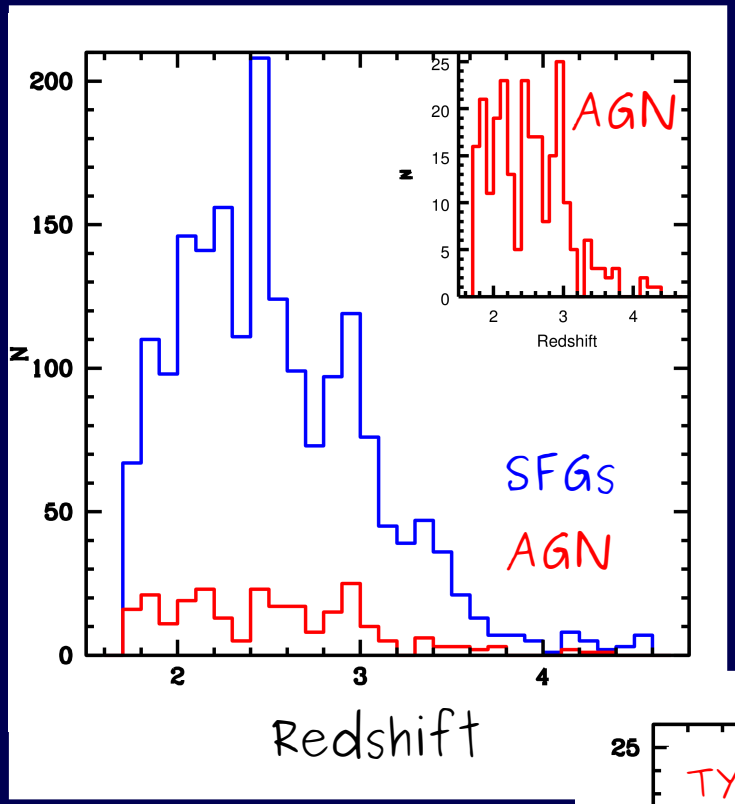
Nebular emission lines

Low-ionization IS absorption lines

High-ionization IS absorption lines

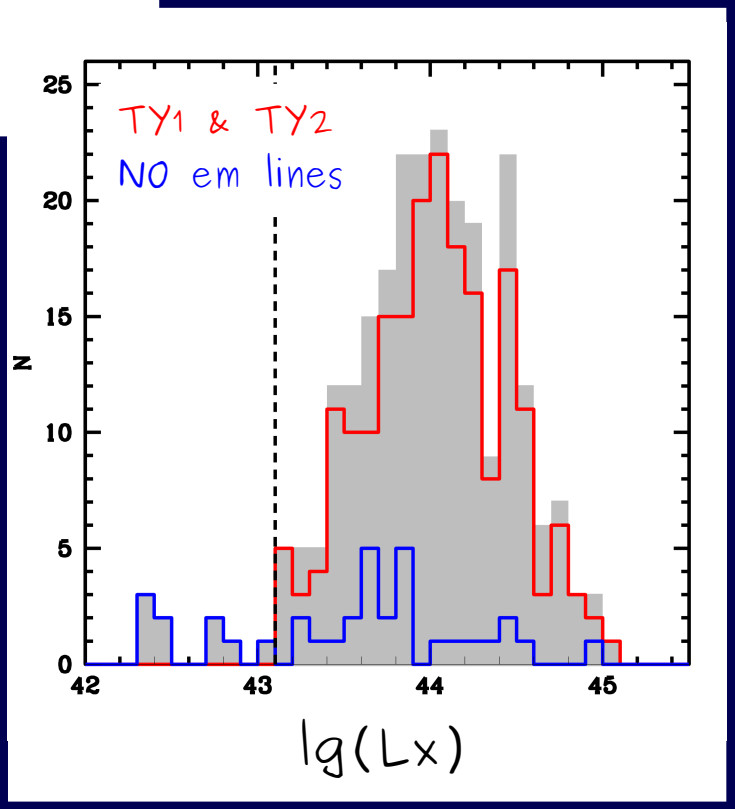
The Data

Talia et al. 2016 in prep.



Redshift distribution of the total sample

Lx distribution of the AGN sample



GOODS-South + COSMOS fields

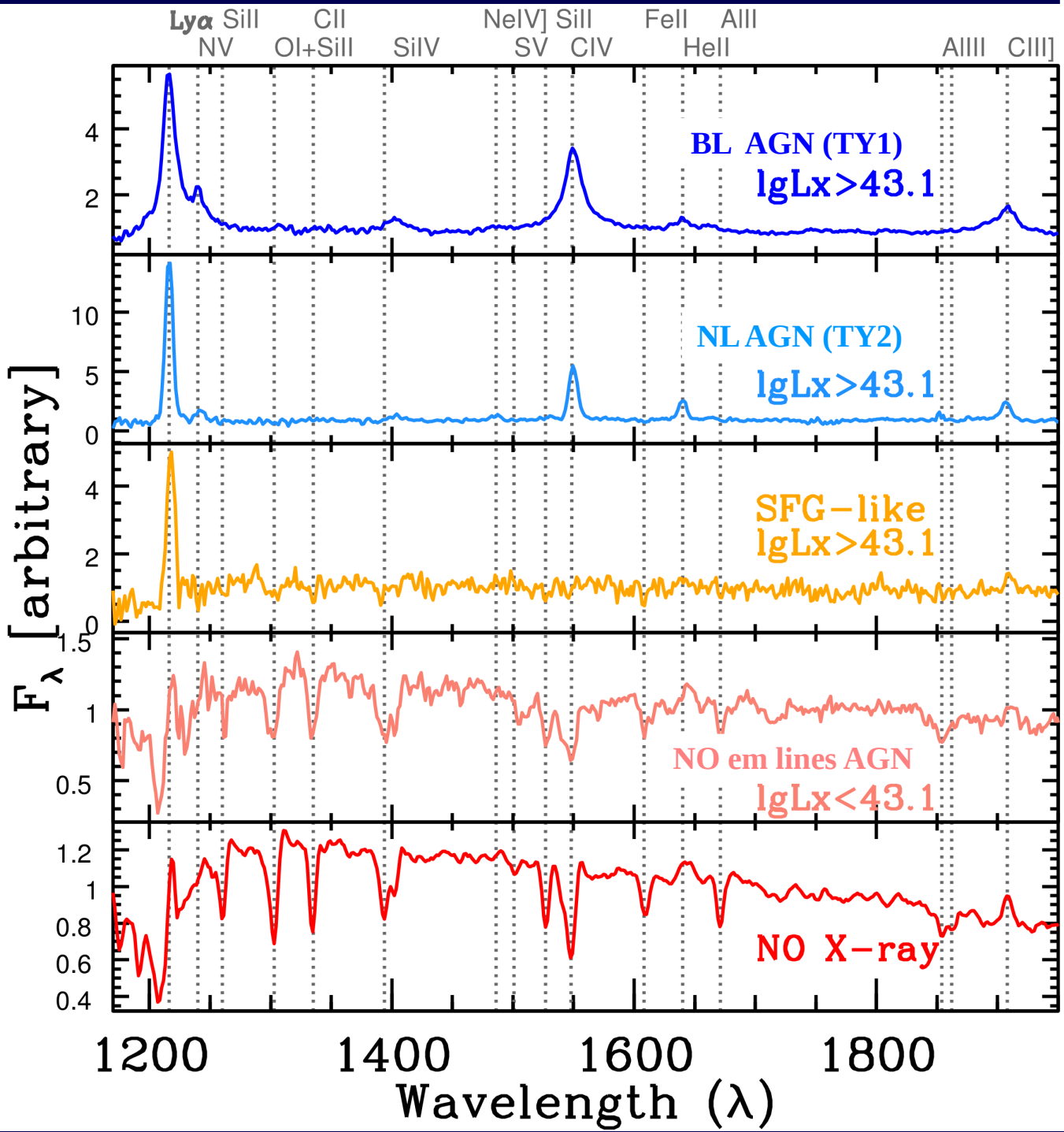
K < 24
[Graziani+'06, Ilbert+'13]

AGN identification based on X-ray from CHANDRA
[Xue+'11, Civano+'12]

~1700 spectra from:
VUDS
Public ESO Surveys
zCOSMOS
...
[Szokoly+'04, Mignoli+'05, Lilly+'07, Vanzella+'08, Popesso+'09, Silverman+'10, Trump+'09, Kurk+'13 Le Fevre+'15]

Talia et al. 2016 in prep.

The Stacks



Dependence of outflows on AGN spectral Type and Lx

<u>3 spectral classes</u>

No emission lines

Narrow line

Broad line

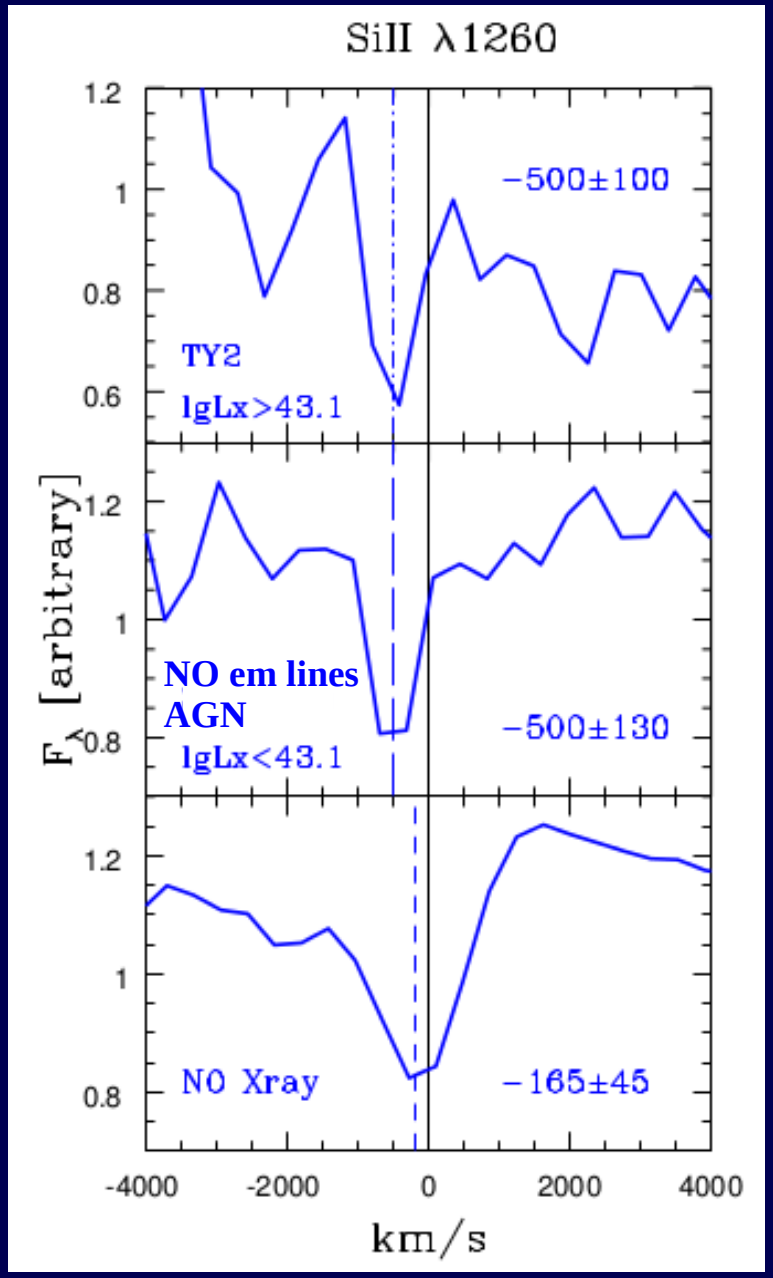
<u>3 Lx bins</u>

NO Xray (NO AGN)

LgLx<43.1 (AGN)

LgLx>43.1 (AGN)

The Outflows: main results



1) Outflows are faster in galaxies hosting an AGN w.r.t. inactive SFGs

2) In the AGN sample there seems to be no dependence of outflow velocity on spectral type and/or Lx

3) These results hold from z=1.7 up to z=4.6

Talia et al. 2016 in prep.