

Emitting objects in OTELO survey: AGN hunting



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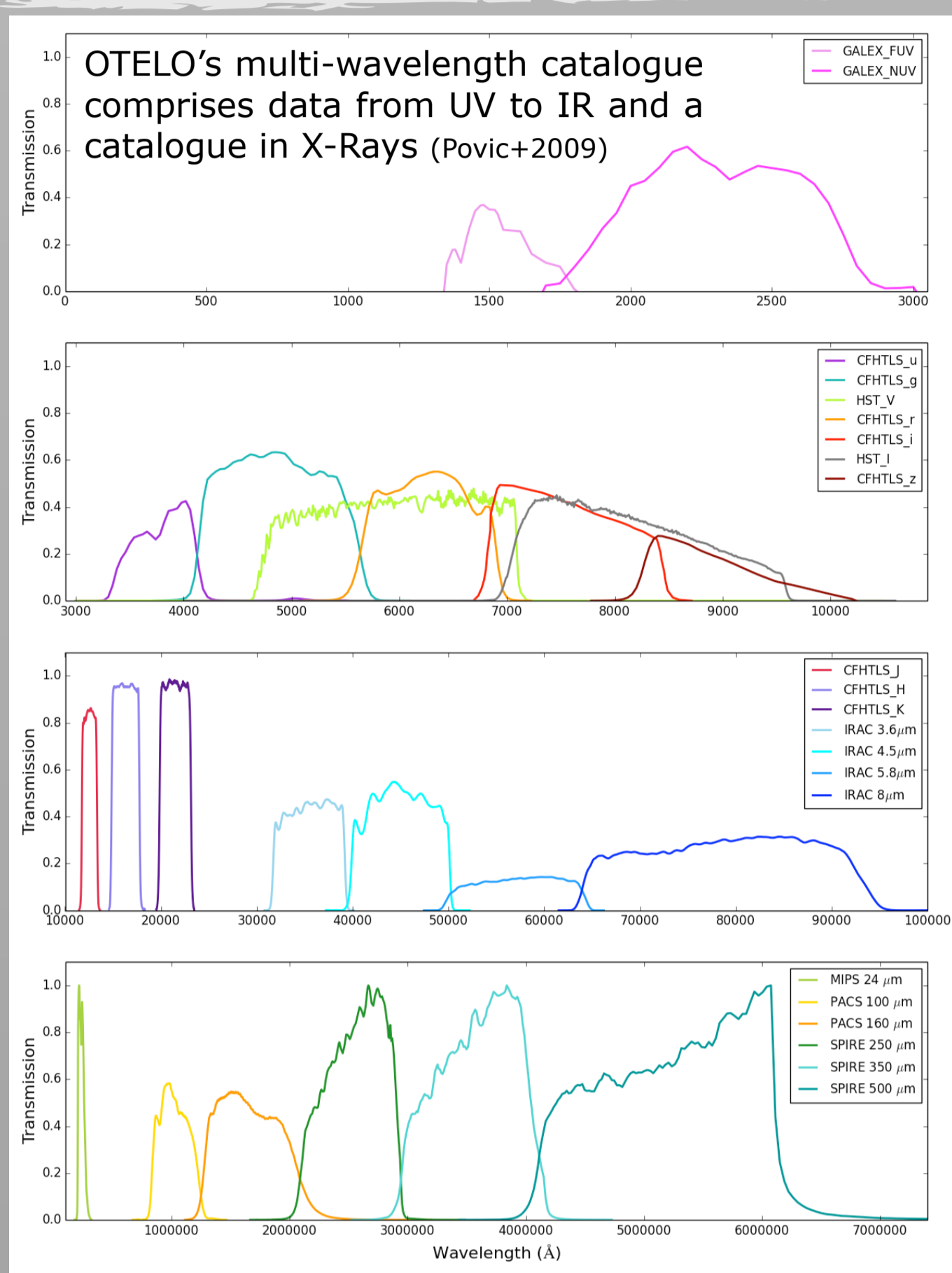
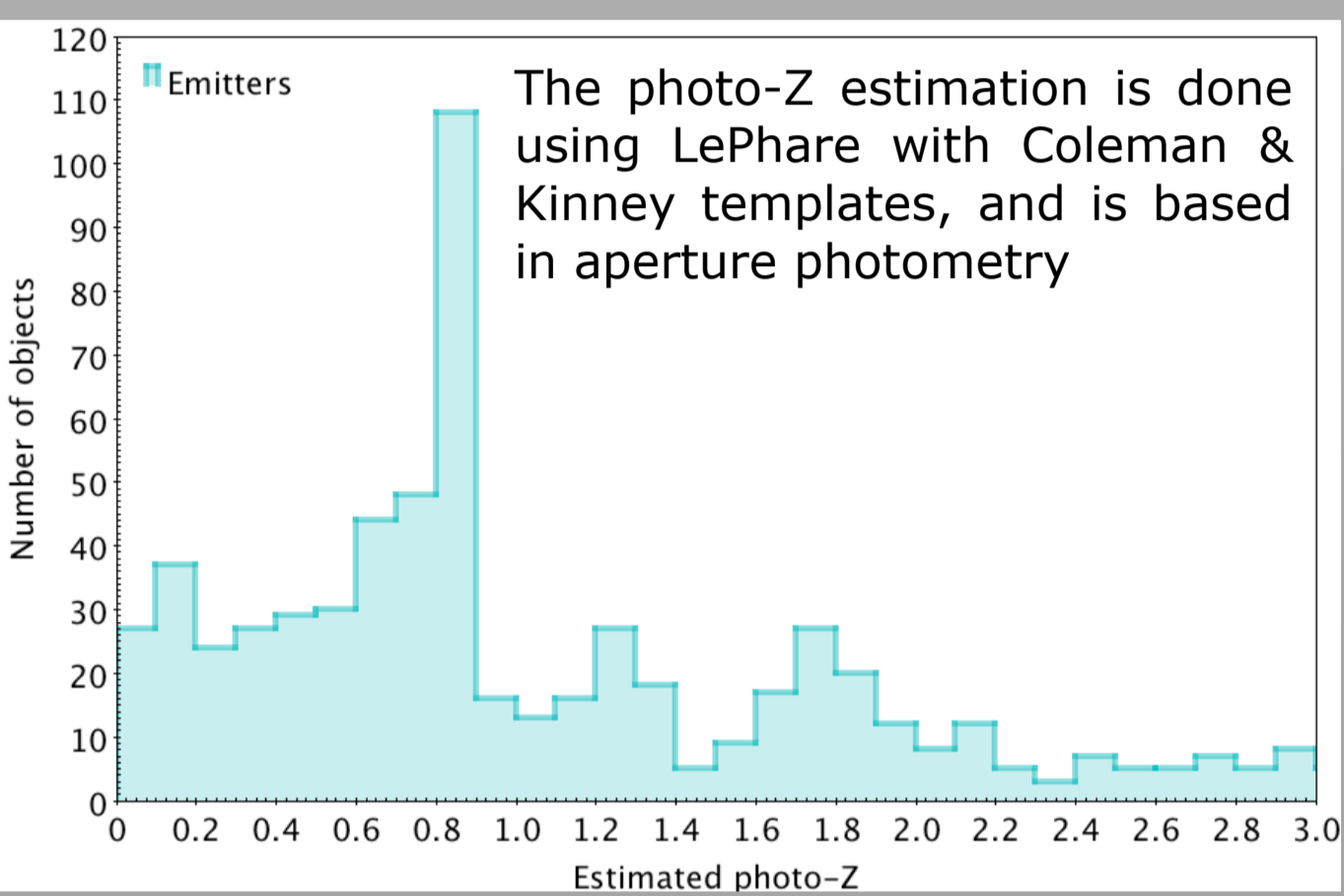
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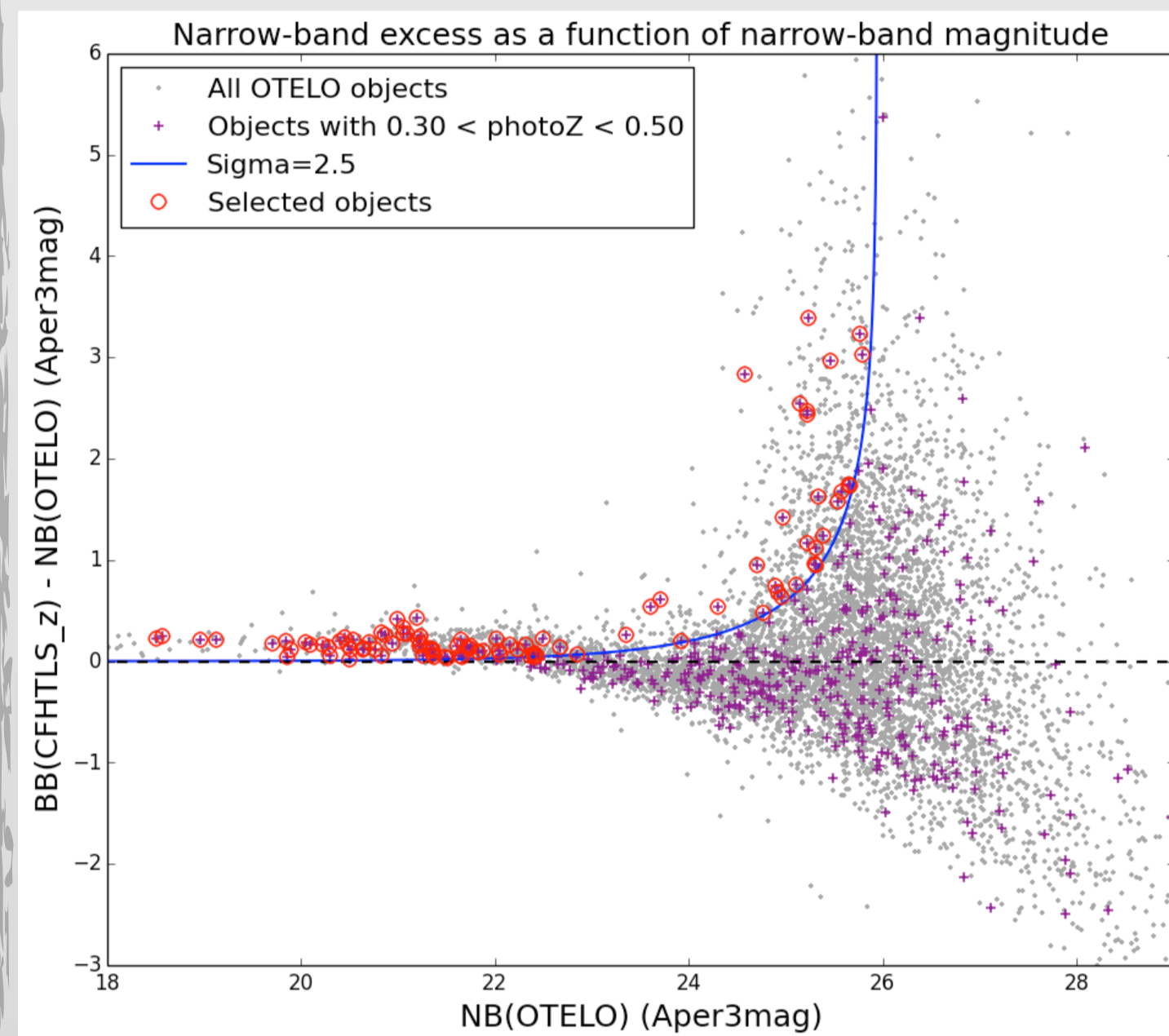
OTELO multi-wavelength catalogue & photo-z estimation

OTELO (OSIRIS Tunable Emission Line Object) is the emission-line object survey carried out with the red tunable filter (TF) of the instrument OSIRIS at the GTC, whose aim is to become the deepest emission-line object survey to date.

- Limiting integrated flux: $1.8 \cdot 10^{-20}$ erg/s/cm²/Å
- 11237 objects detected up to 3σ
- 1030 emitting objects selected with an automatic algorithm and a visual inspection of the pseudo-spectra

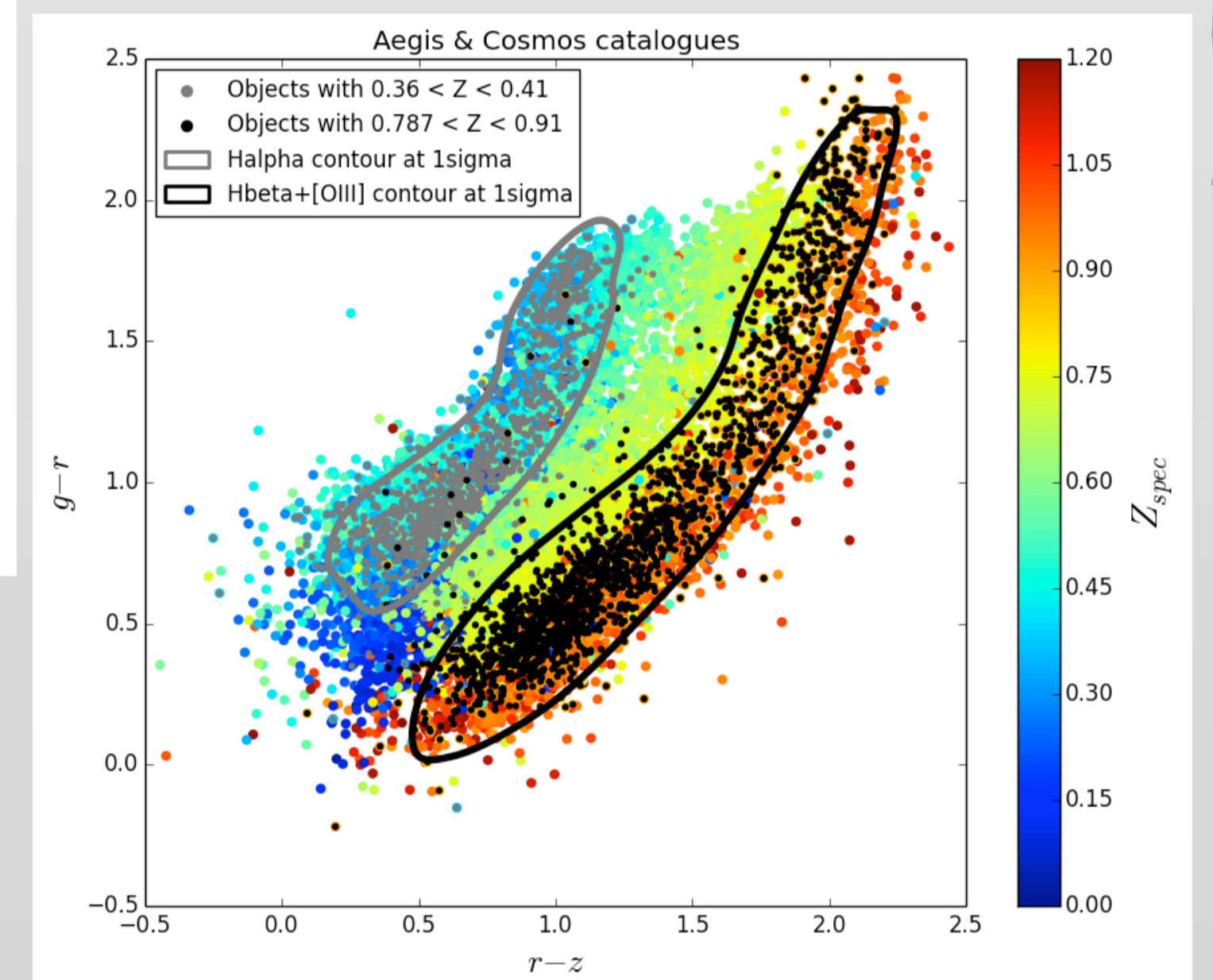


Color-excess...



Following Bunker+1995 and Sobral+2012, we plotted the narrow-band excess as a function of narrow band magnitude using aperture photometry, both for objects with photo-z corresponding to H α and H β /[OIII], in order to find objects that could have escaped the classification. After a visual inspection we kept 6 H α and 9 H β /[OIII] emitters.

We also performed a color-color analysis of our sources, using data from the Aegis & Cosmos catalogues. We determined the 1σ contour that includes the objects with Zspec in the range of H α and H β /[OIII]. After a visual inspection, we kept 20 H α emitters that had not been previously selected, as well as 62 H β /[OIII] emitters.



...and color-color diagrams

Identification of lines

The identification of the emission line of an object is made using:

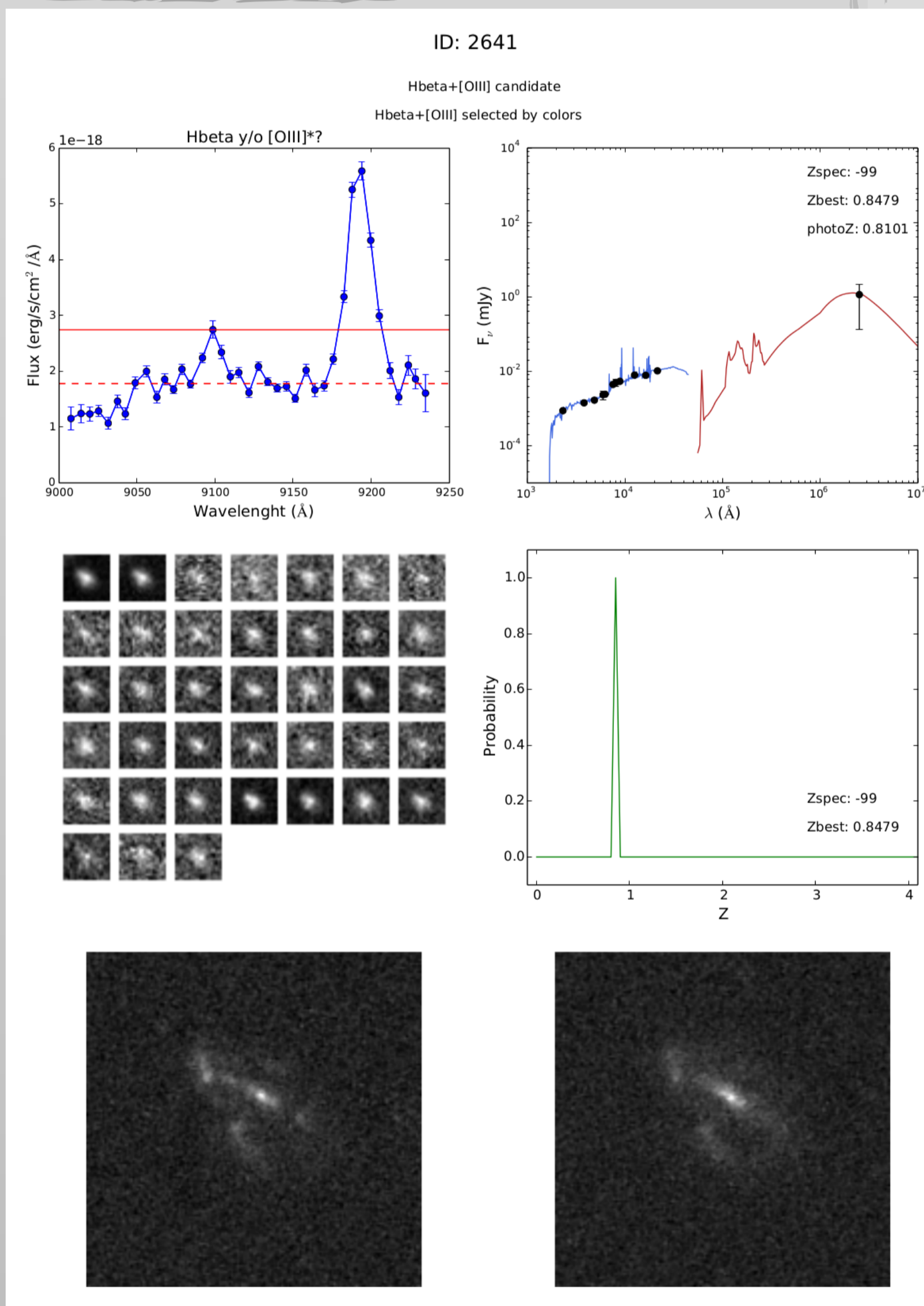
- the spectroscopic redshift of the object, if any
- its pseudo-spectrum from OTELO,
- its SED fitting from LePhare
- its 36 images in OTELO's tunable filters slices,
- its probability distribution of photo-z,
- its V and I images from the HST and
- its color-color information

From the 1030 emitting objects:

- 1/3 have no redshift information
- 1/3 have been classified
- 1/3 have not been classified, mainly due to a bad SED fitting

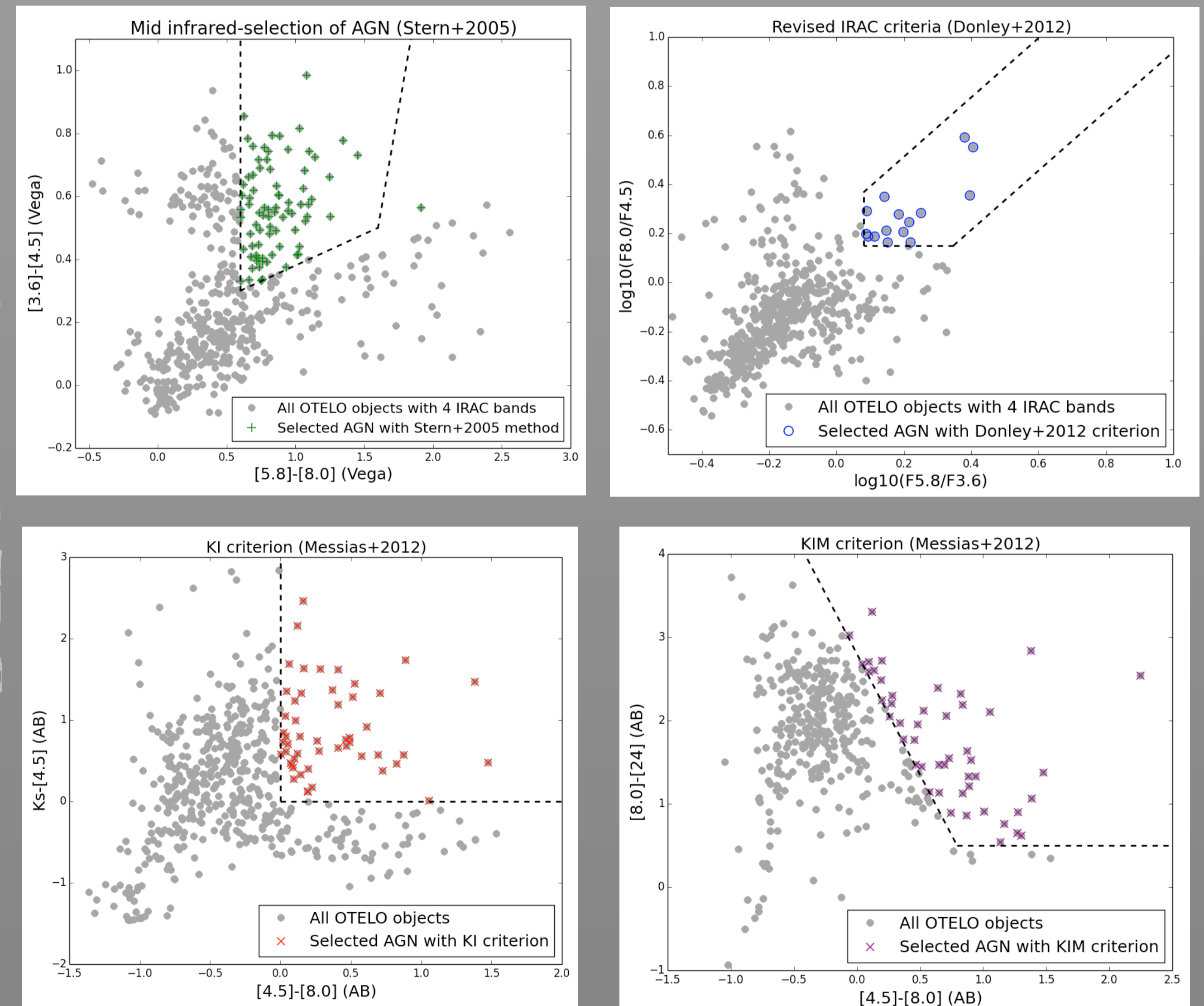
We found:

- 63 H α emitters
- 209 H β /[OIII] emitters
- other lines: [SII]6716, [OI]6300, [NeIII]3869, NeV/NeIV, HeI5876, H δ /[SII]...



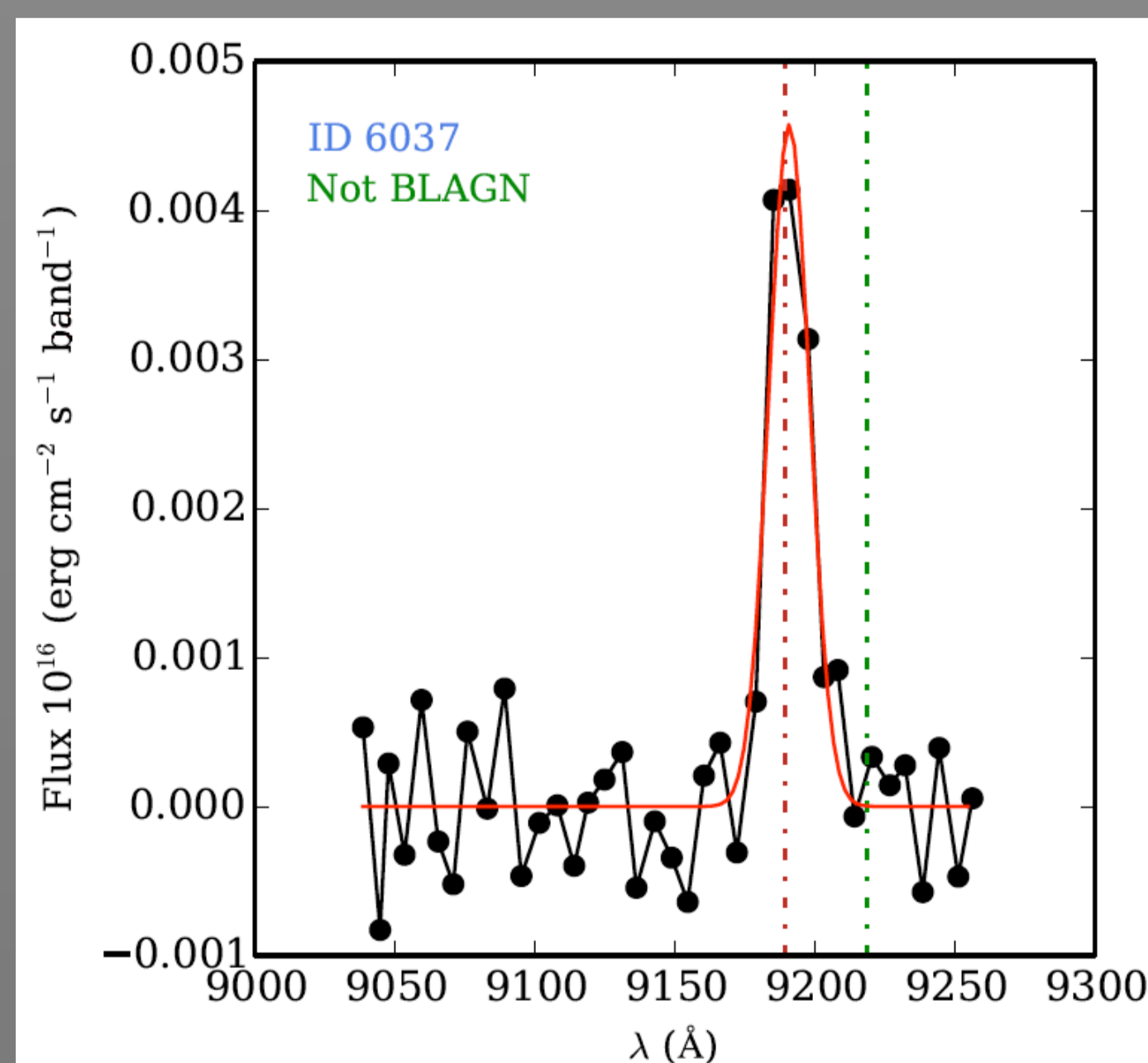
AGN diagnostics diagrams

To distinguish between Active Galactic Nuclei (AGN) and Star-Forming Galaxies (SFG) we use diagnostic diagrams. A few examples are, from top to bottom and from left to right: the mid-infrared selection of AGN (Stern+2005), the revised IRAC criteria (Donley+2012), the KI criterion (Messias+2012) or the KIM criterion (Messias+2012).



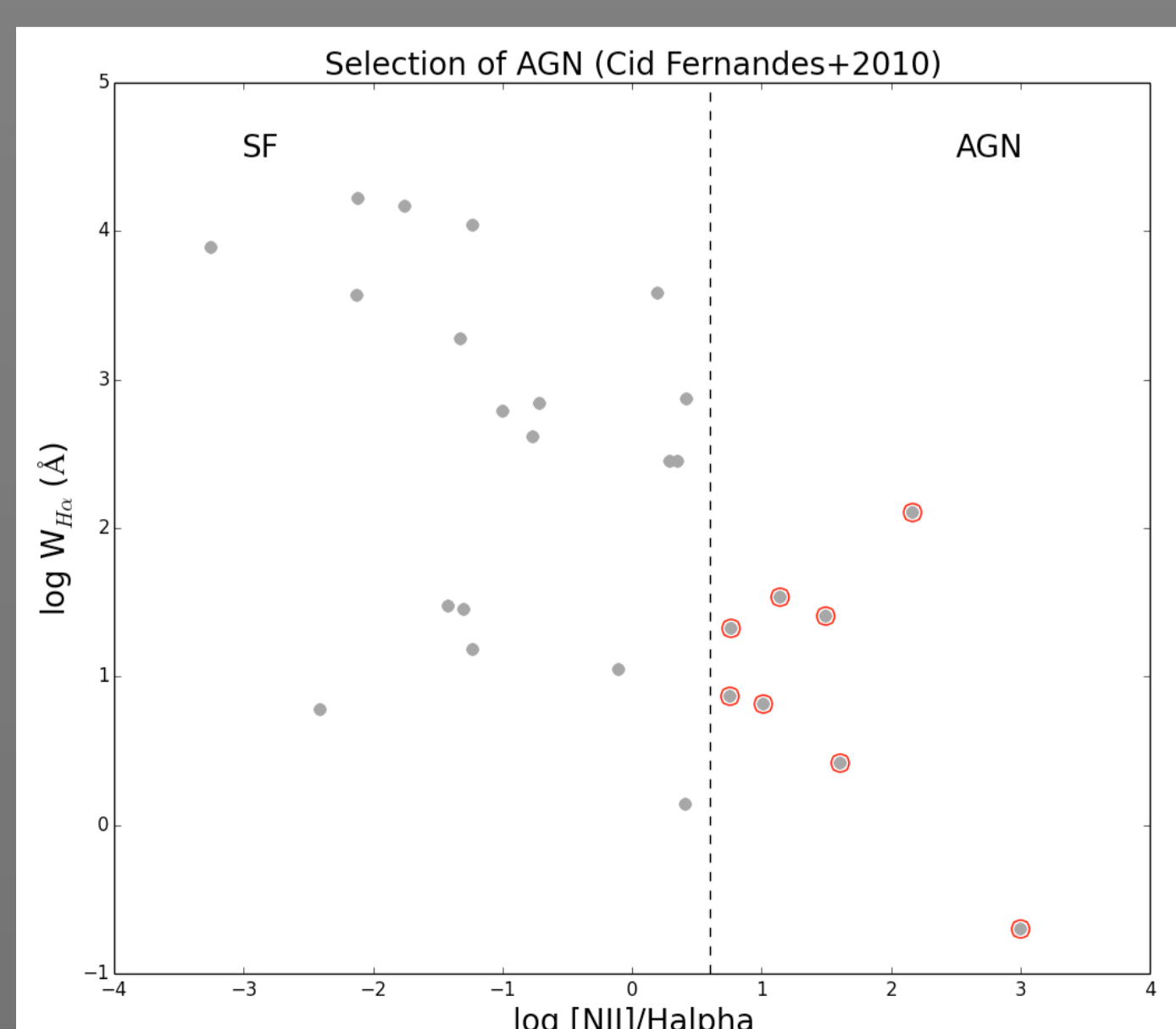
Each method has its own particularities, limitations and range of application. Conclusive results for OTELO are still pending.

AGN selection & H α + [NII] flux estimation



BLAGN:

The selection of Broad-Line AGN is done by fitting the pseudo-spectra of our H α emitters to the TF-convolved gaussian of a real BLAGN from the Sloan Digital Sky Survey.

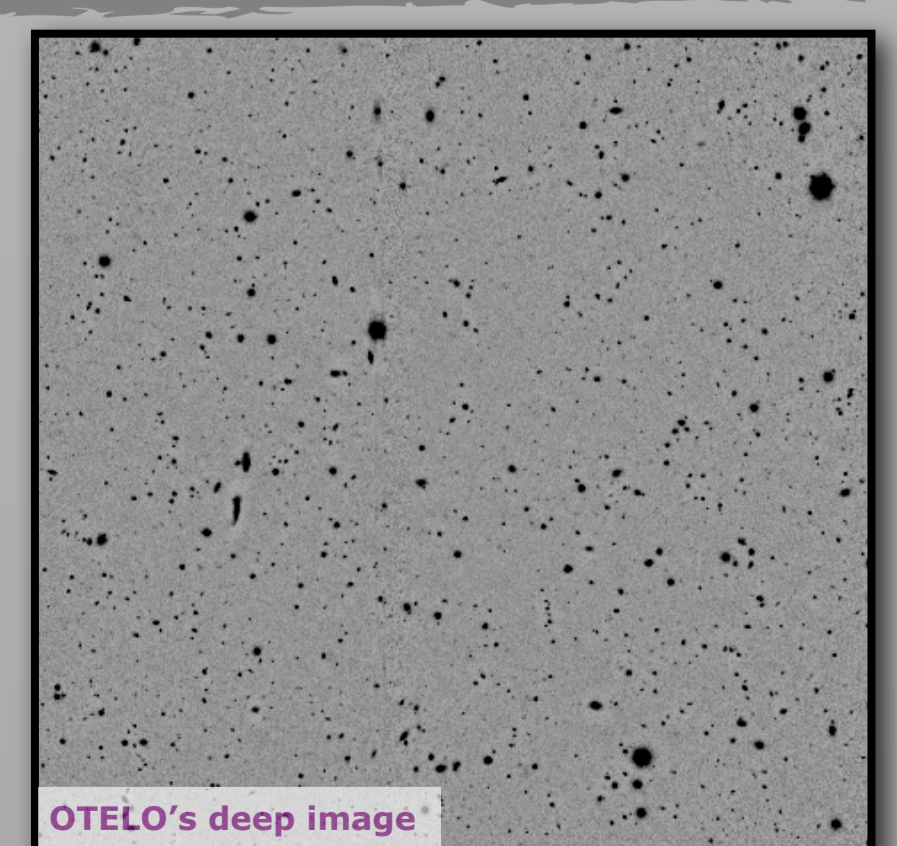


NLAGN:

The selection of Narrow-Line AGN is made using Cid-Fernandes+2010 diagnostic criteria, that separates star-forming galaxies from AGN. Previously, the H α + [NII] fluxes and equivalent widths are determined as in Sánchez-Portal+2015. To do that, the two lines are deblended using a set of equations that assumes infinitely thin lines (J.Cepa, private communication).

Next steps!

- Improve and conclude the H α + [NII] flux estimation and the selection of AGN with the diagnostic diagrams here shown.
- Select more AGN based on their X-Ray emission (as in Povic+2009).
- Study and analyse OTELO's AGN population.



For more information about OTELO, don't miss:

- J. Cepa's talk on Thursday, 09:00
- J. Nadolny's poster on the morphological classification of OTELO's sources
- Á. Bongiovanni's poster on the very high redshift component of OTELO

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