OU-SPE Status

Michele Moresco

On behalf of OU-SPE

University of Bologna, Department of Physics and Astronomy

A team effort (with a significant Italian contribution)

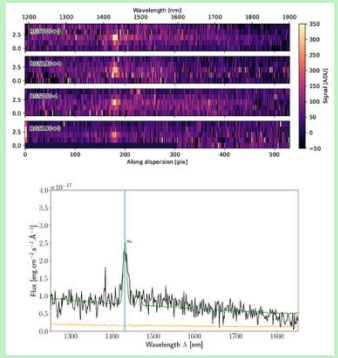
- Vincent Le Brun : lead
- Didier Vibert : co-lead, algorithms, …
- Pierre-Yves Chabaud/Gaelle Daste : algos, pipeline integration, data handling…
- Ali Allaoui, Fanny Dufresne : redshift measurement and other stuff
- Thomas Bédrine : redshift measurement, PA/QA tools
- Morgan Gray, Jean-Charles Meunier, Simon Conseil : ML dev
- **Michele Moresco, Emanuel Rossetti**: Line flux measurements, pipeline integration
- **Daniela Vergani, Eliana Palazzi, Elisabetta Maiorano, Lucia Pozzetti, Salvatore Quai, Margherita Talia, Gianni Zamorani, Zhiying Mao, Fabrizio Cogato, Eduardo Medinaceli, Nicola Borghi**, Yannick Copin: Validation, simulations, Line flux measurements
- Matthieu Bethermin : Galaxy Classification, redshift interlopers, P/C,…
- Claudia Scarlata : IST Blue Grism, …
- Yannick Copin, (**Bianca Garilli**) : SIR contact

A crucial role has been played by Bianca, she will be missed, and not only for this

The spectroscopic analysis pipeline

OU-SPE

OU-SIR



combined 1D spectrum

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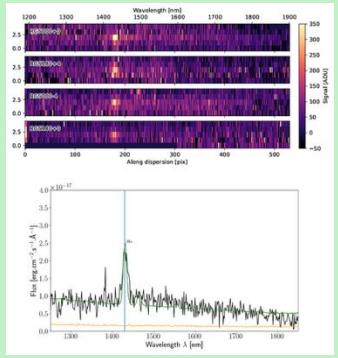

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Redshift determination and reliability

Least-square fit:
- model w. **emission lines** (+ IGM abs, extinction)
- model w. **emission lines** + **stellar continuum**

Redshift prior: strong lines, Ha, N(z)

ML supervised method using the full PDF shape and trained on Deep spectra for z reliability

Spectral classification: galaxy/QSO/star (based on spectrum)

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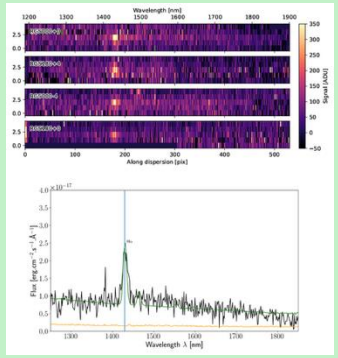

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Two independent **methods**:
- multi-component Gaussian Fit
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Lines divided into main (always measured) and secondary (only > amplitude-over-noise thresh)

Measurements for QSO and absorptions (above a given thresh)

Lines measured at the 5 redshift solutions

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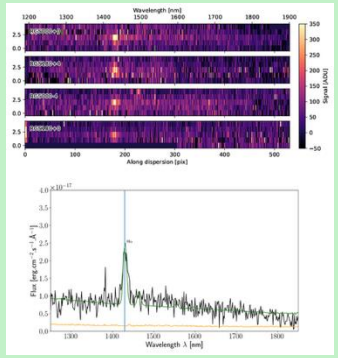

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- redshift probability and reliability
- spectral classification
- flux, EW, line center, FWHM, SNR, fit quality, continuum, luminosity

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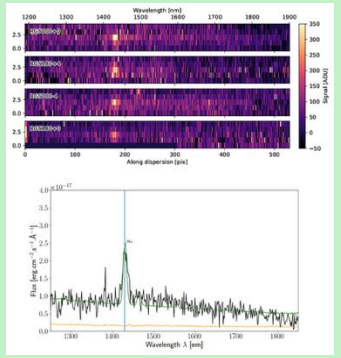

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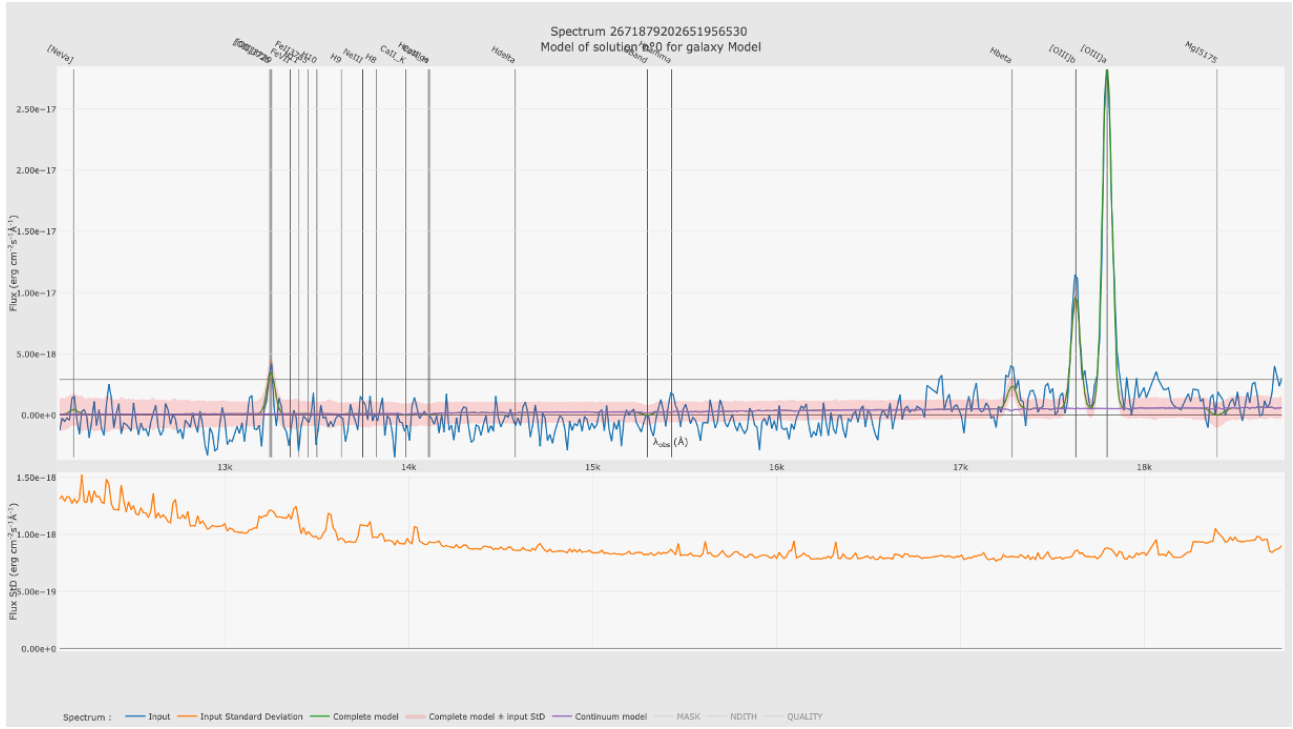
OU-LE3

OU-SPE outputs

Redshift determination



OU-SPE outputs

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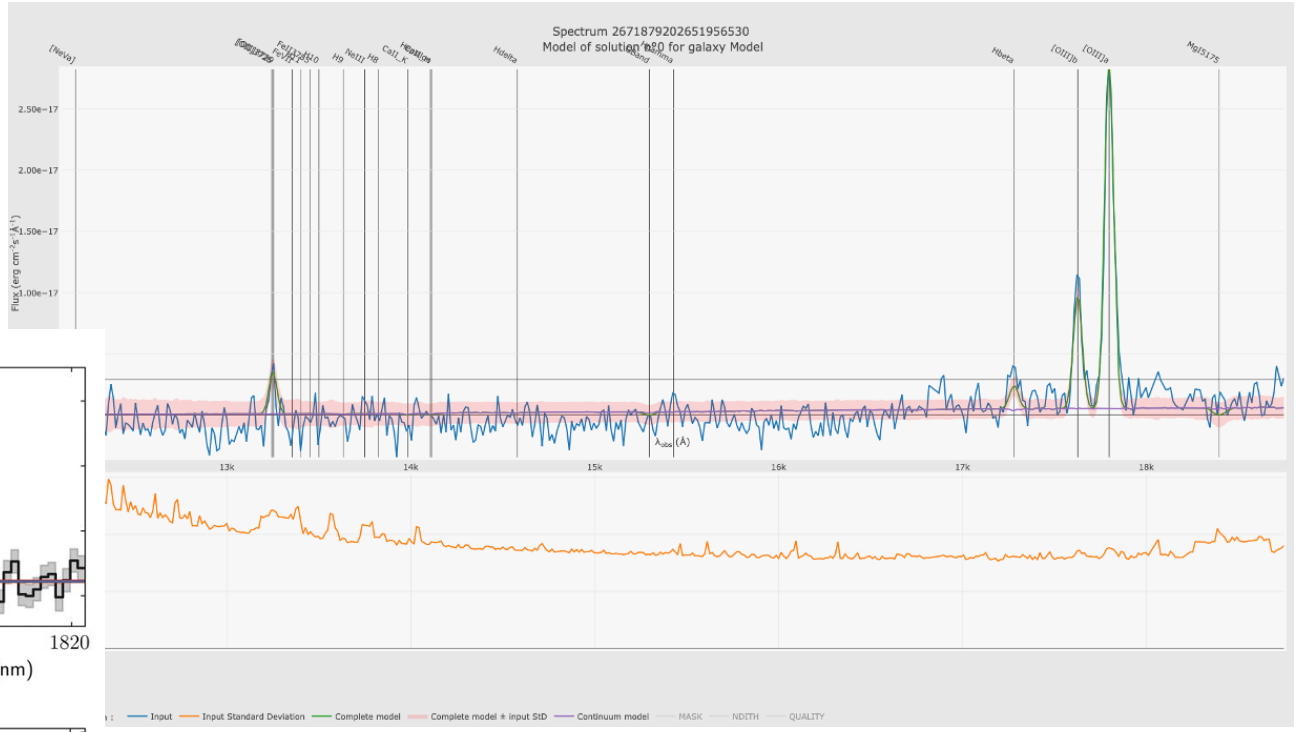
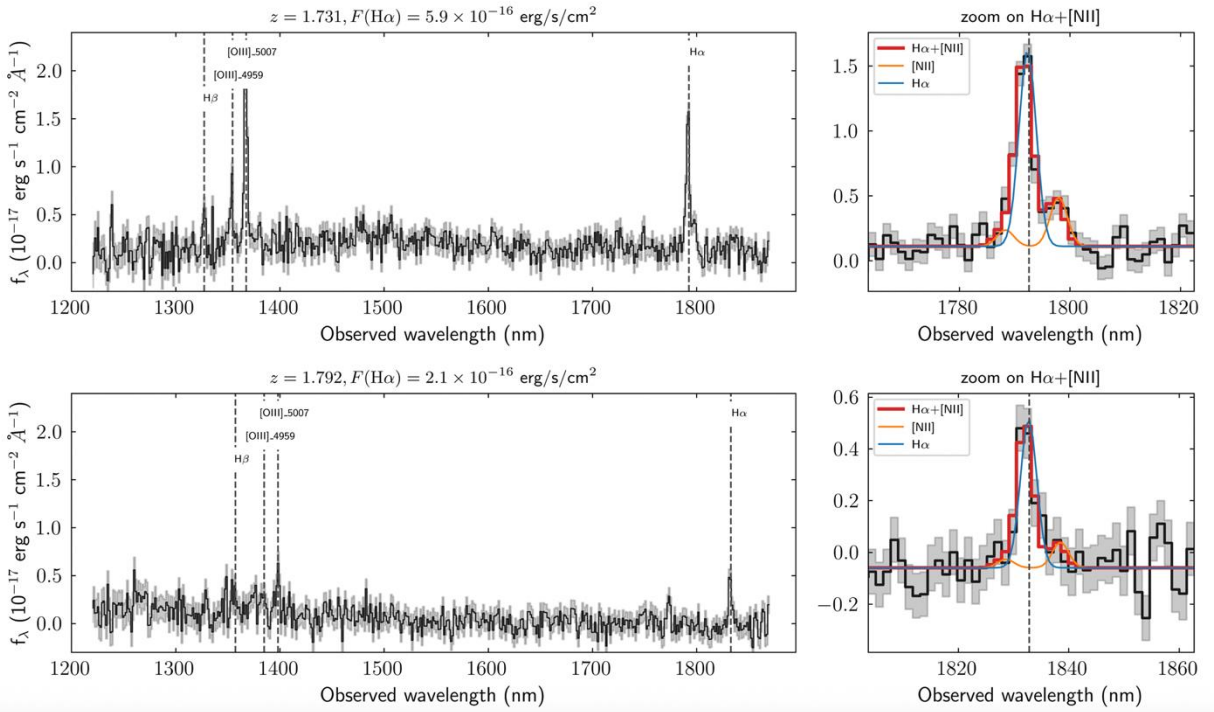
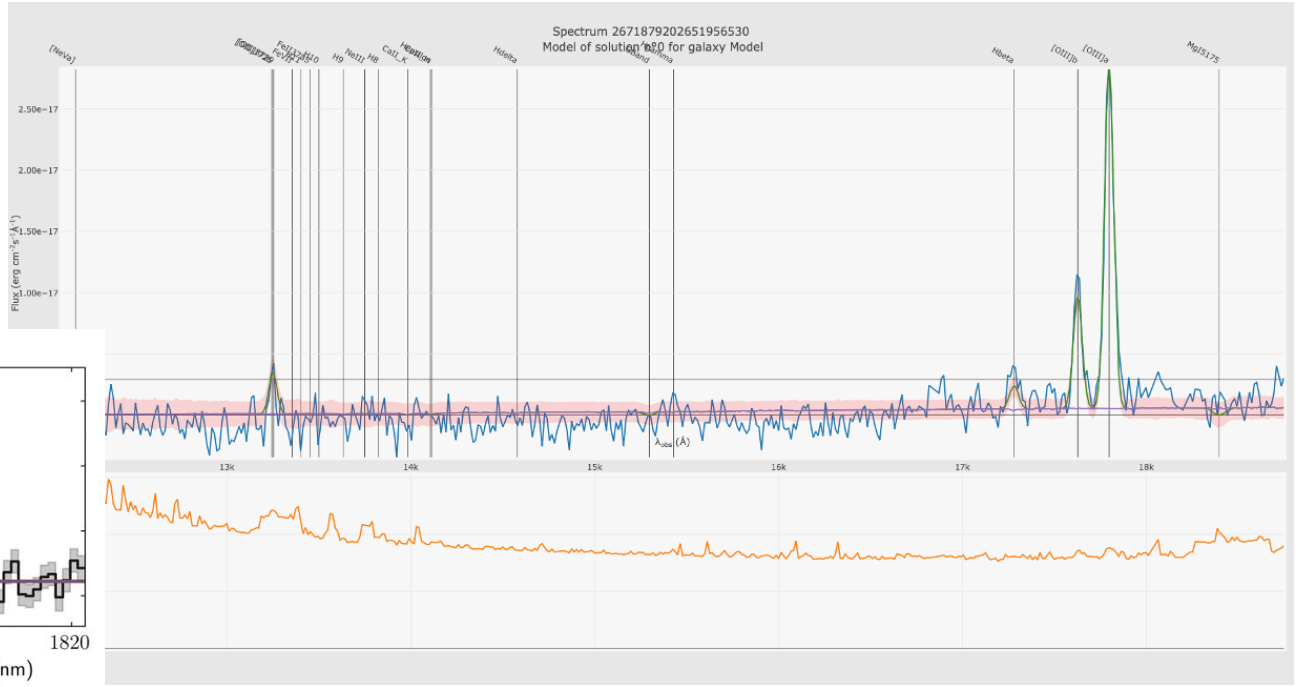


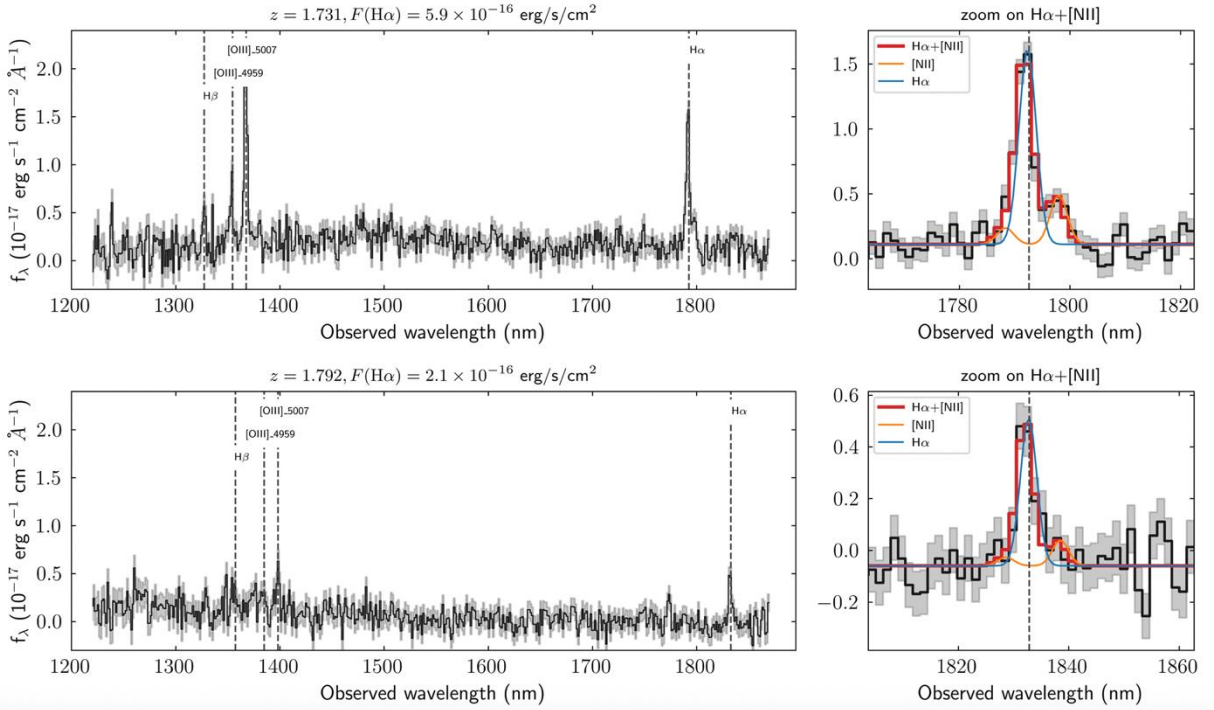


Gaussian fit to the emission line

OU-SPE outputs

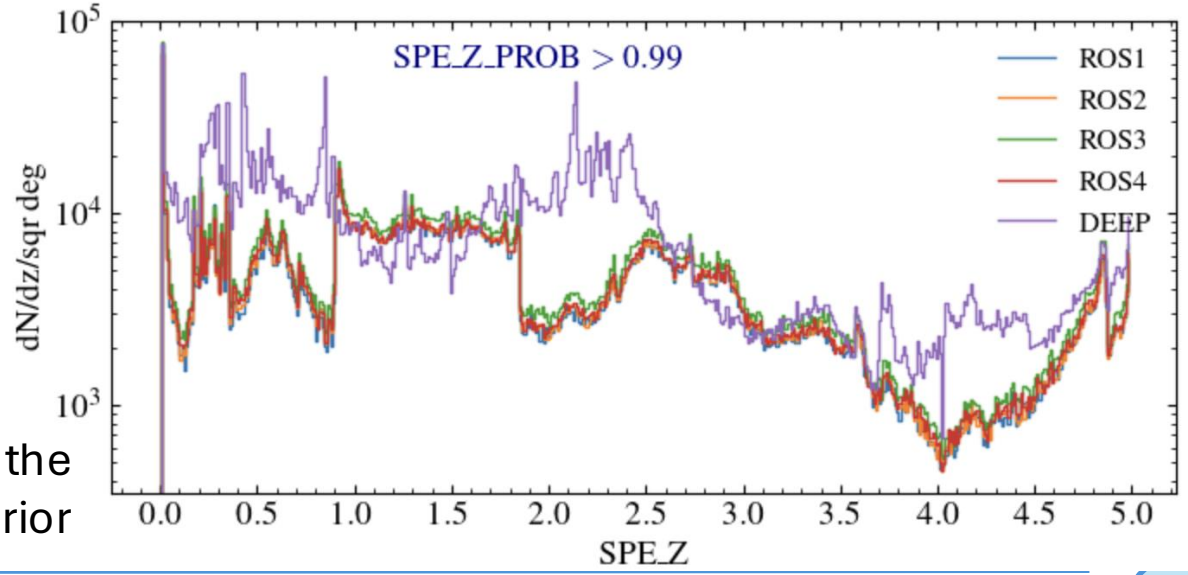
Redshift determination





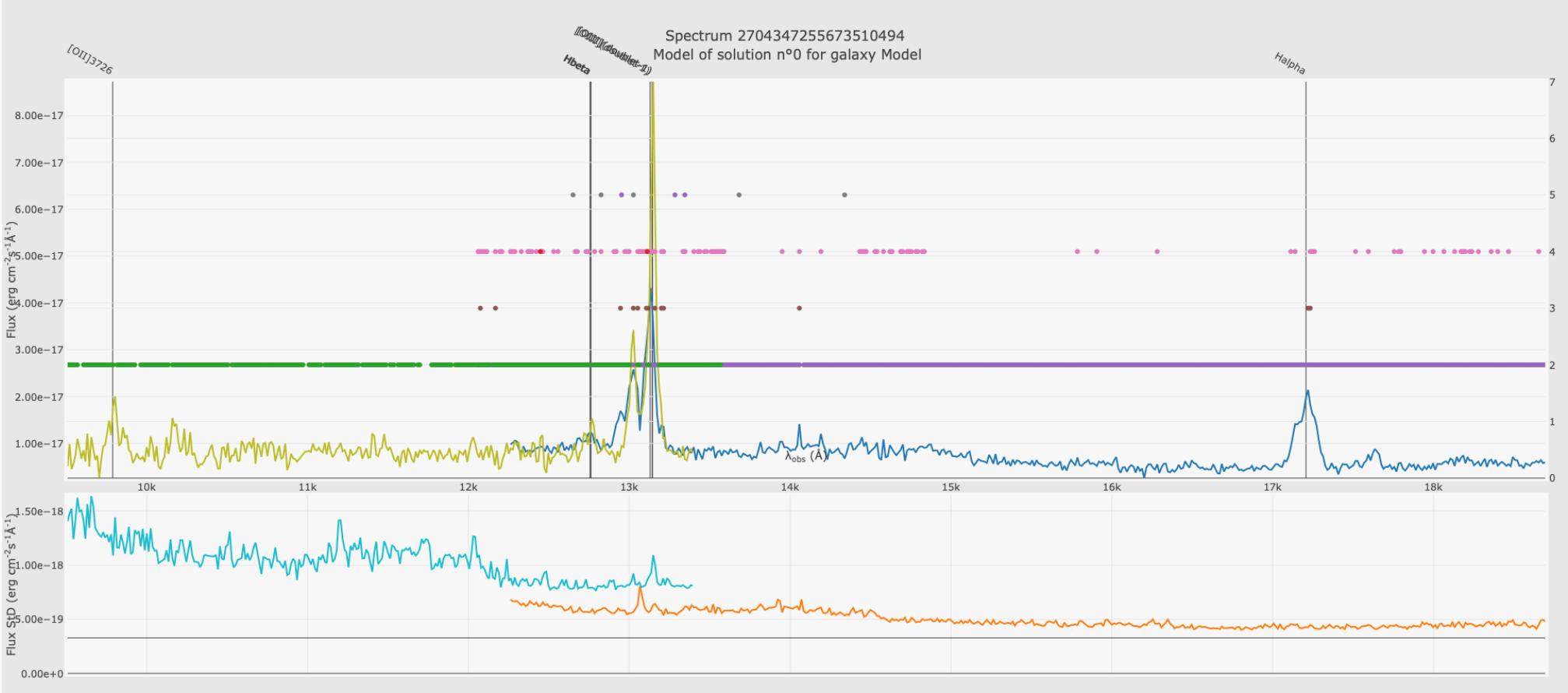
Gaussian fit to the emission line

Impact of the redshift prior



Main improvements w.r.t. Q1

- Implementation of improved combined RGS+BGS analysis (at the likelihood level) ⟶ crucial for the Deep



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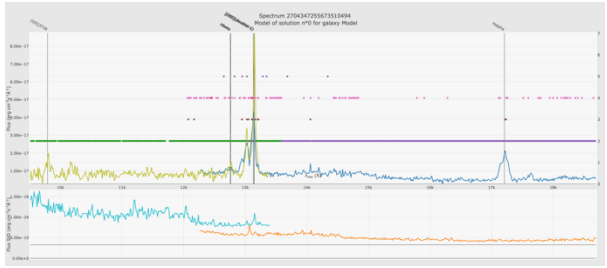

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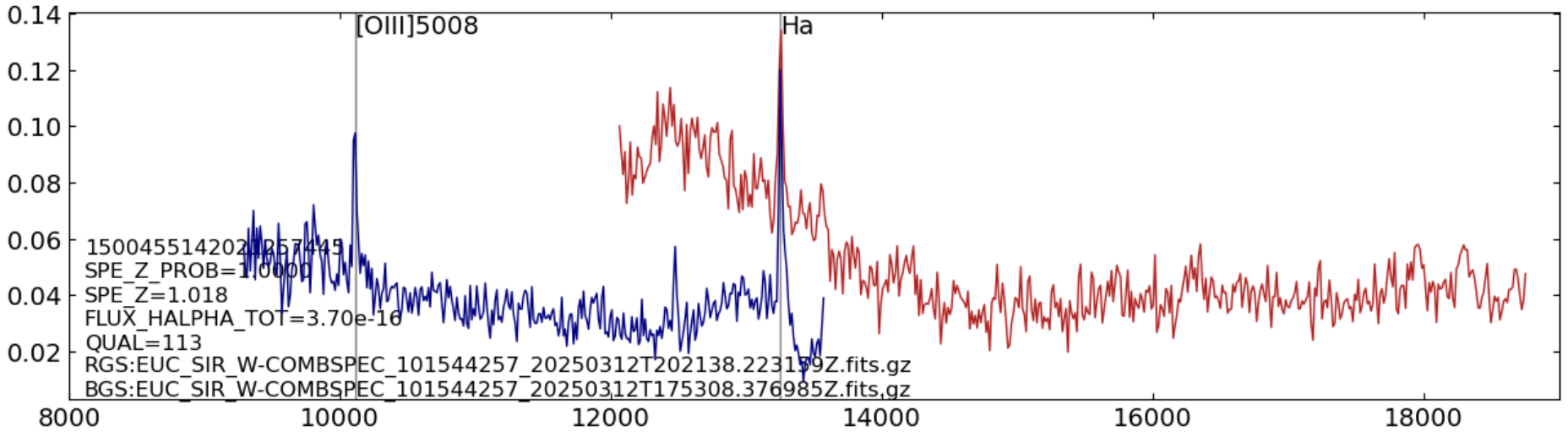

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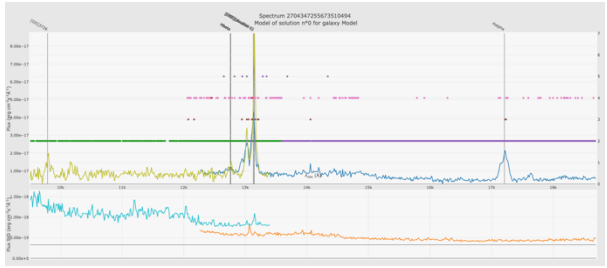

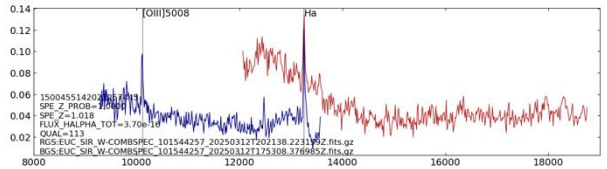

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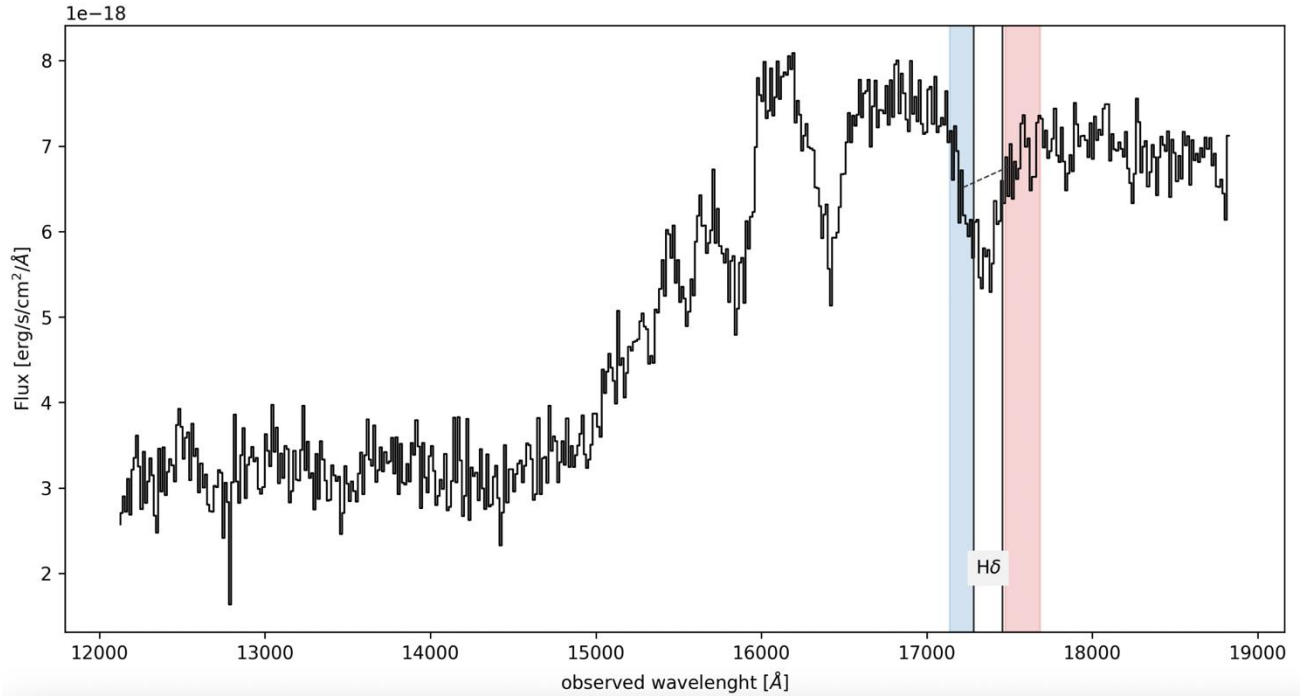

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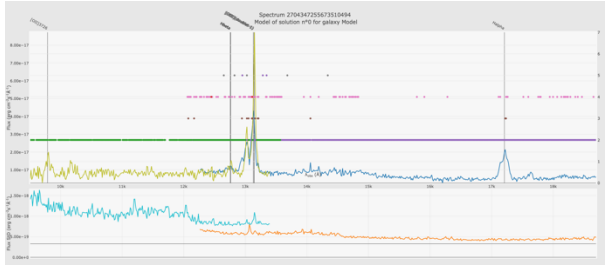
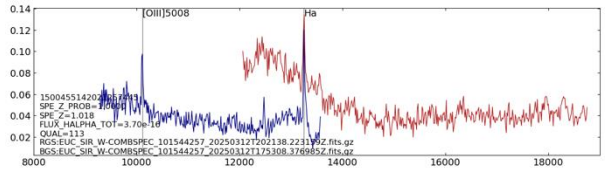
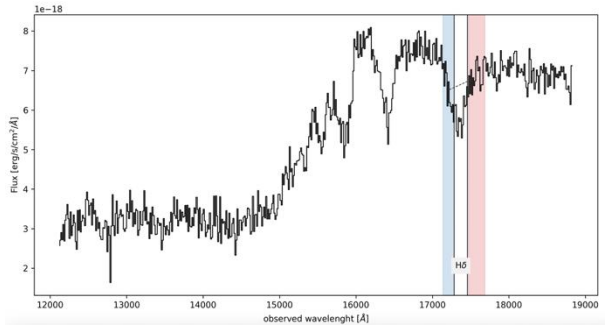
- Bug corrections







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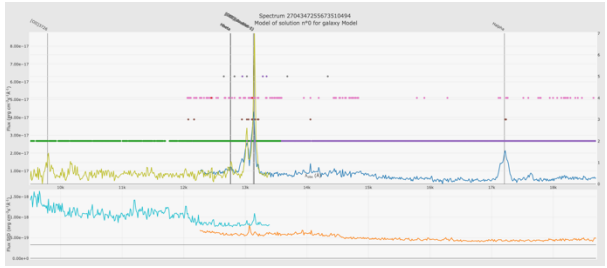
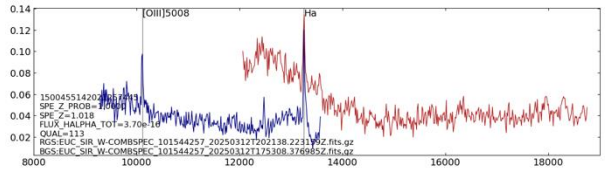
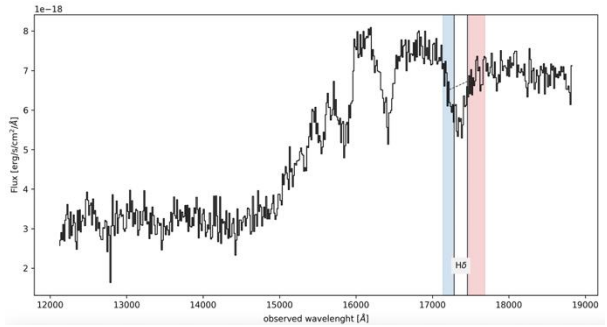
- Revised automated OU-SPE report







SPE validation report

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Dataset release : NA
Tile index : 101544258

Input
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23-185614-8-combined_spectra-0 (pipeline version 5.0.6)
Blue SIR combined product : -
Configuration set product : EUC_SPE_WIDE_CONFIG_AMZ1.2.0-REV2-EUCLID
Calibration set product : -
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Output
SPE ProcessTiles PPO ID :
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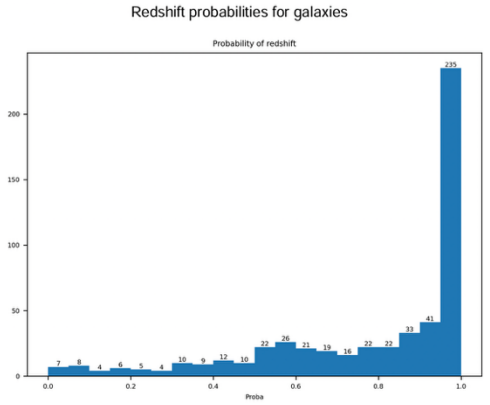
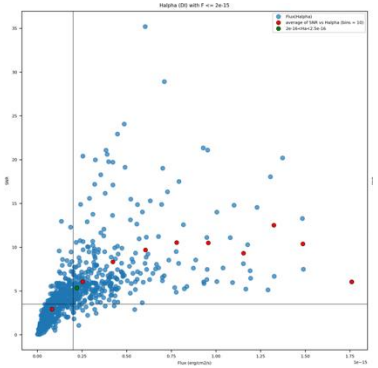
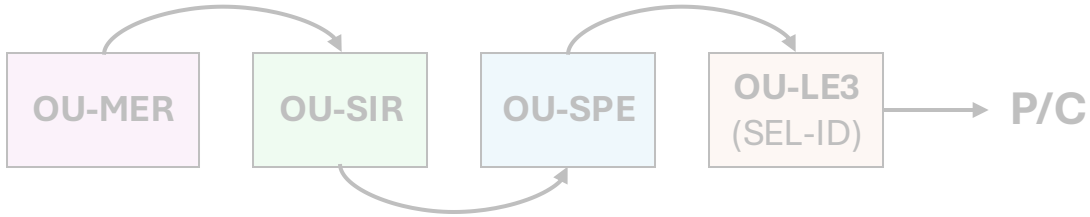




Roadmap to DR1



Campaign of analysis on COSMOS and EDF-N

Combination of improvements in different parts of the spectroscopic pipeline, propagating the results to Purity and Completeness estimate

Roadmap to DR1

OU-SIR*

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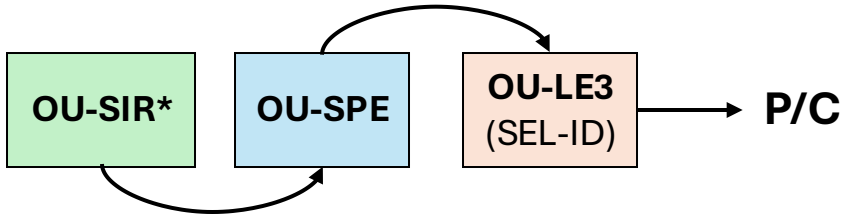

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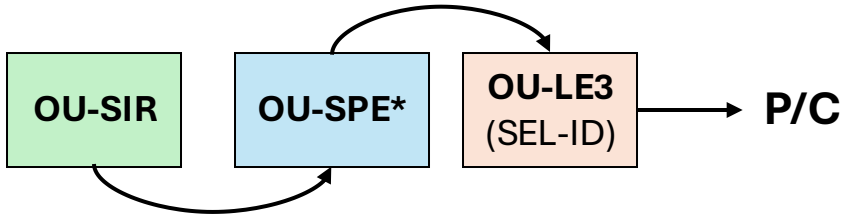

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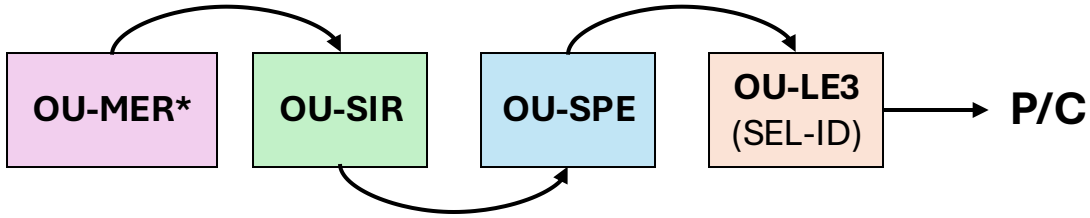

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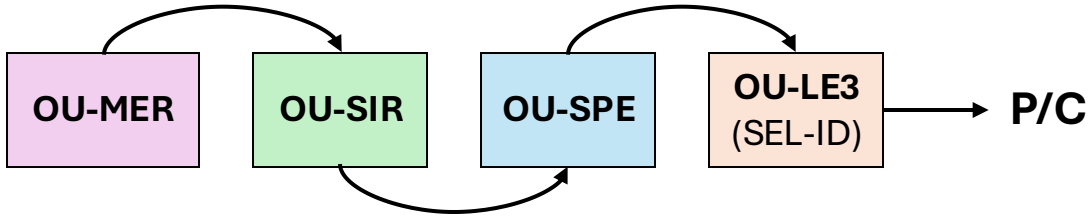

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Open issue: the Deep Fields are not (yet, as expected) deep enough, therefore we are using also reference redshifts from COSMOS and DESI (but biased to different selections)

Several improvements already identified and about to be finalized

SPE-related tests:

- ✓ Test results with and without including the continuum
- ✓ Test results with an hybrid approach (no continuum only below a given threshold
- ❑ Test results changing the intensity of the Ha prior *(ongoing)*
- ❑ Newly trained reliability on real data