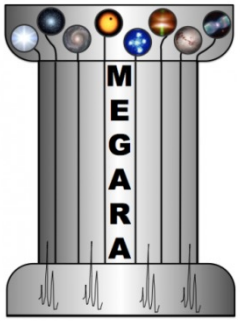
Star Forming Dwarf Galaxies with MEGARA

The case of PHL293b

Jorge Iglesias Páramo
Instituto de Astrofísica de Andalucía – CSIC

C. Kehrig, J.M. Vílchez + MEGARA Comm. Team





PHL293b

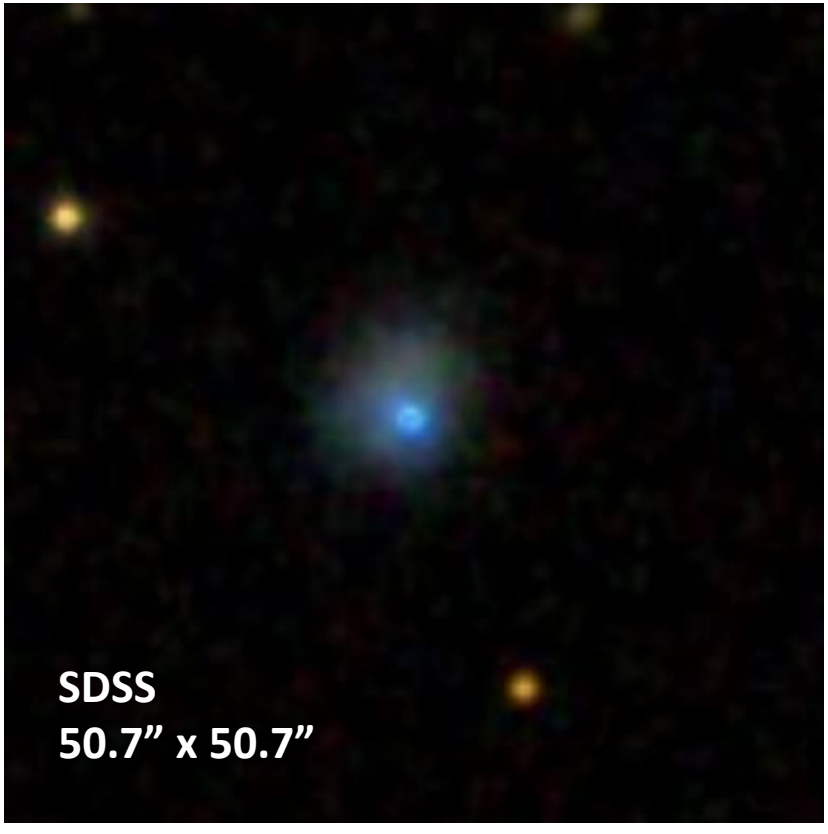
A Blue Compact Dwarf Galaxy with very low luminosity and metallicity:

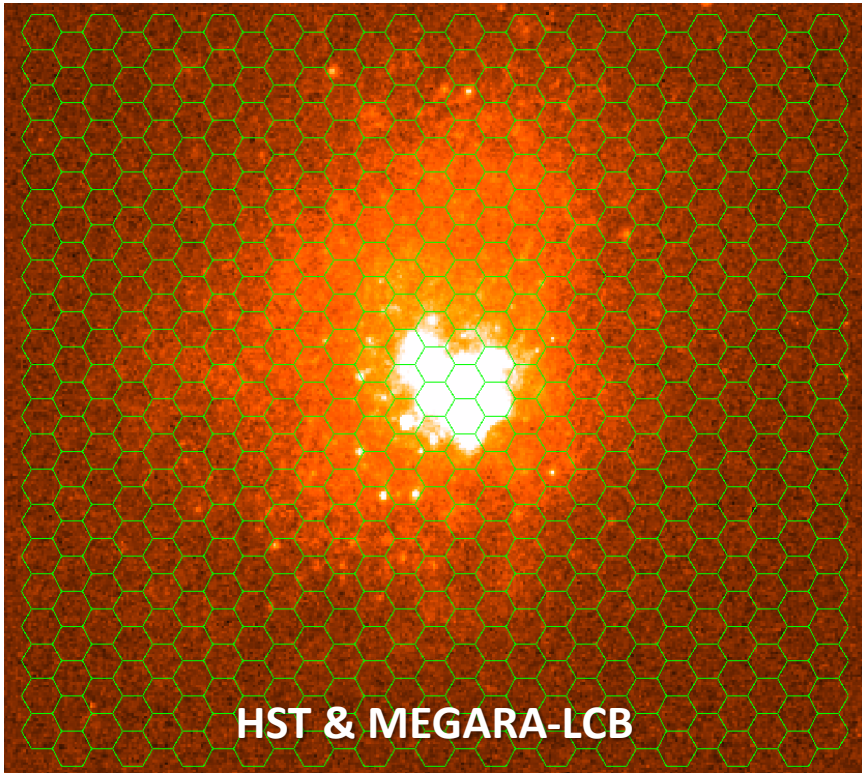
- M_B = -14.37 (Cairós et al. 2001)
- D = 23.1Mpc (NED)
- 12 + log(O/H) = 7.66 (Izotov et al. 2007)

PHL293b

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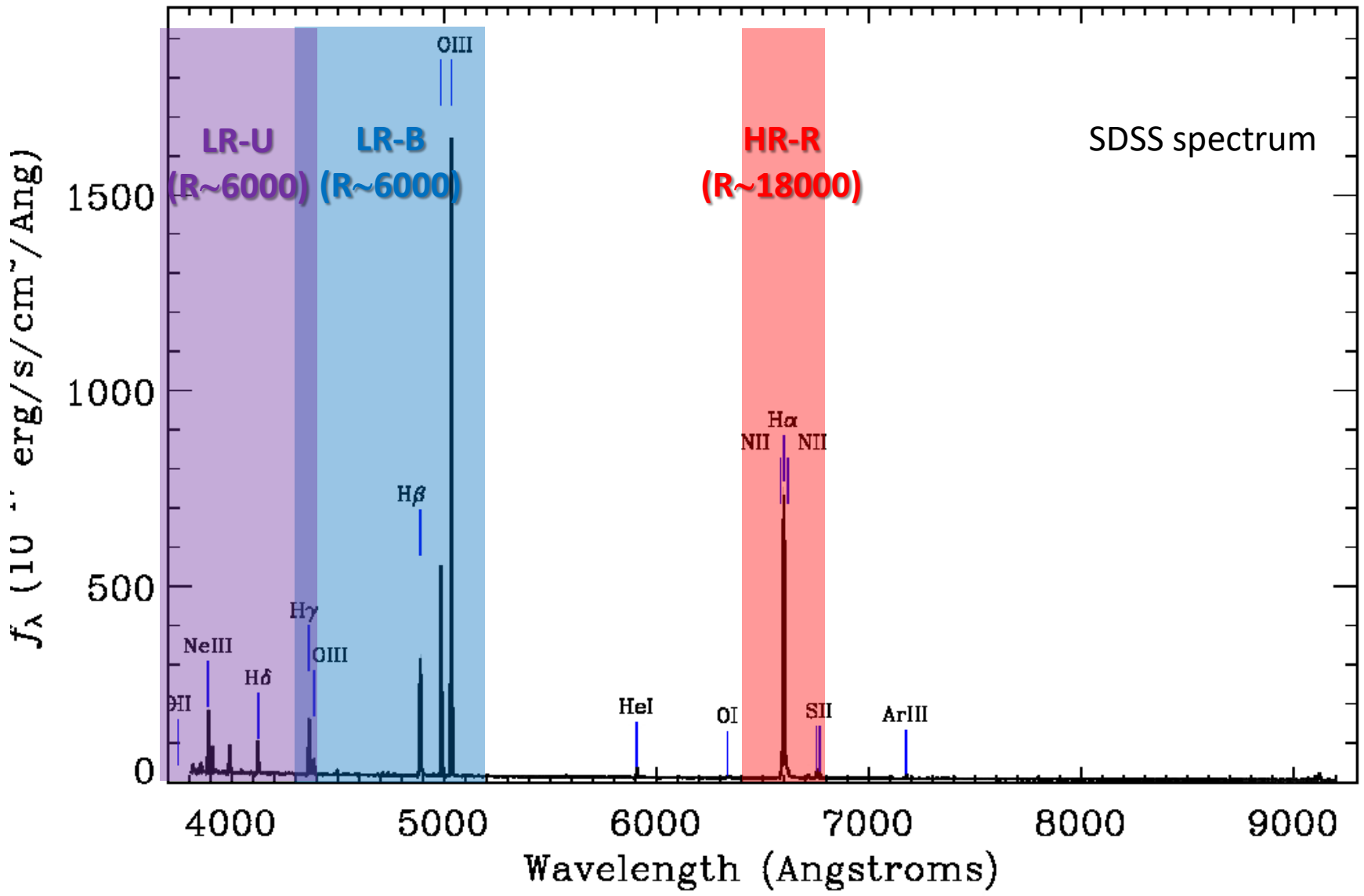


MEGARA observations

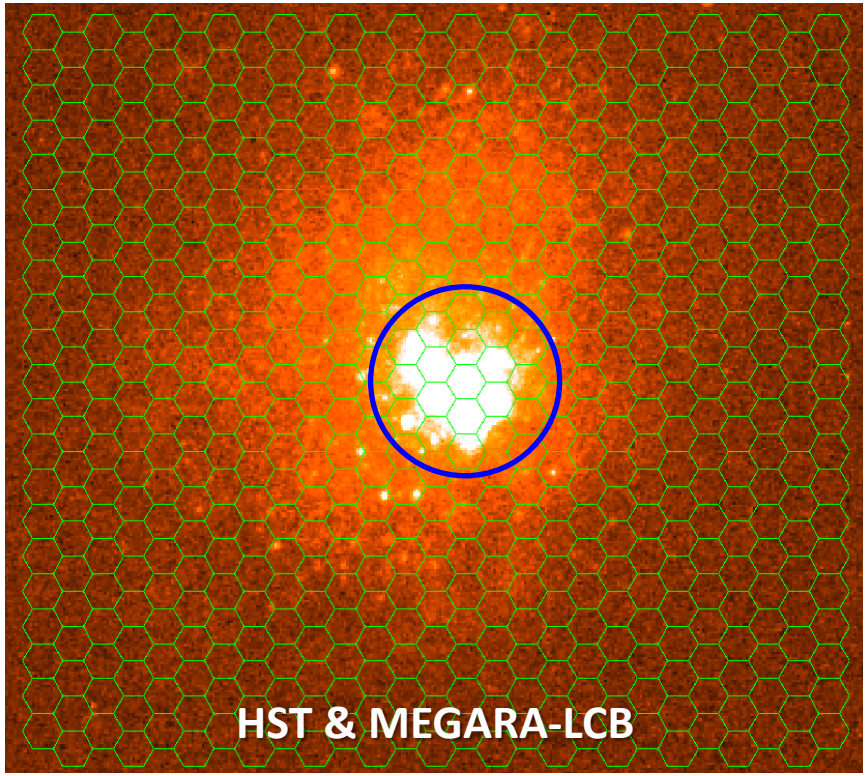
Observed under external seeing conditions ~0.5” and moderate dust content.

VPH	Date	Exp. Time (s)
HR-R	July 25 2017	3 x 600
LR-B	July 25 2017	3 x 600
LR-U	July 29 2017	3 x 1500

Optical spectrum



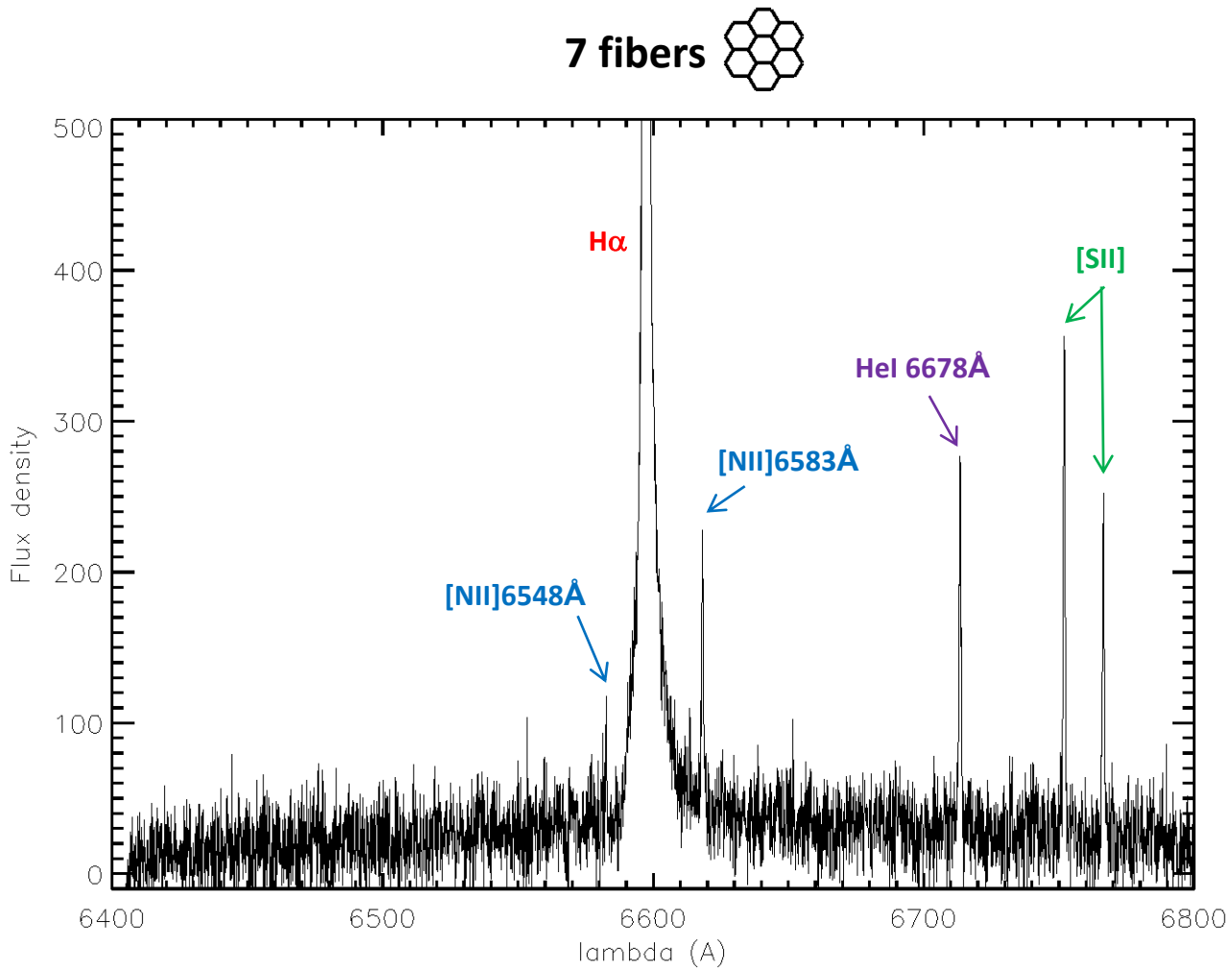
Optical spectrum



Non photometric nights.

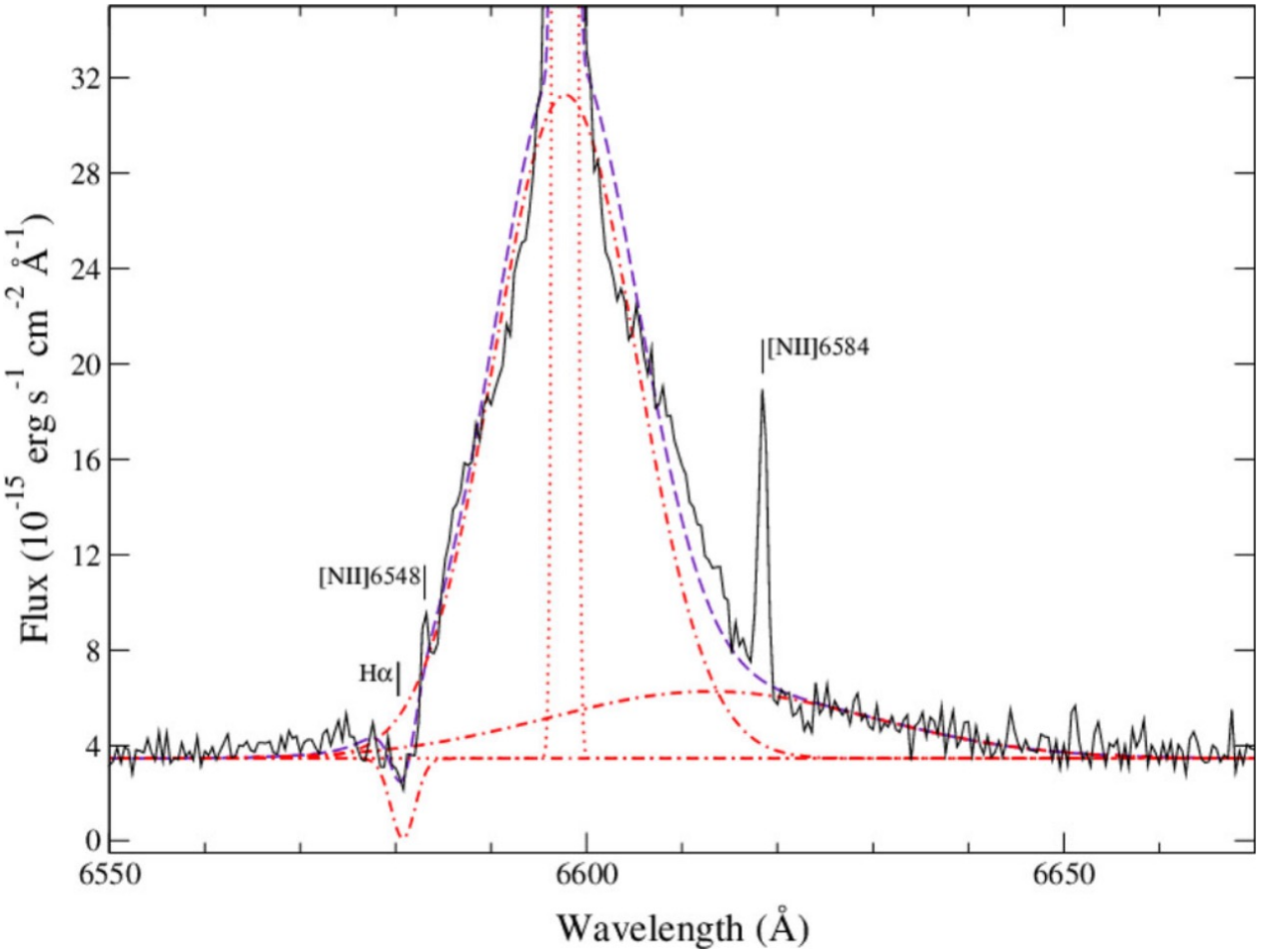
Spectra calibrated with the SDSS spectrum.

HR-R

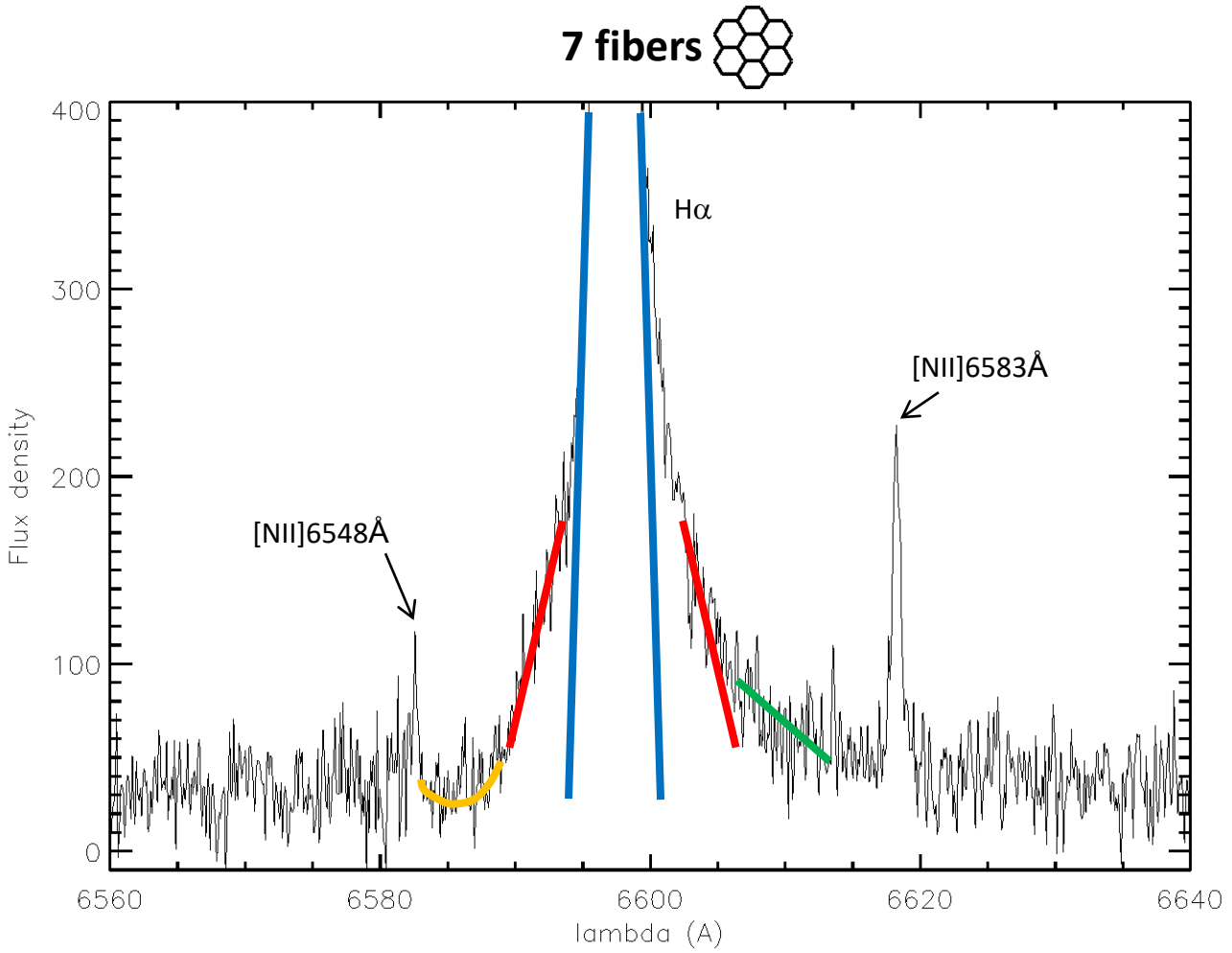

7 fibers
Hα
[SII]
HeI 6678Å
[NII]6583Å
[NII]6548Å
Flux density
lambda (A)
0
100
200
300
400
500
6400
6500
6600
6700
6800

HR-R

Terlevich+2014, X-Shooter

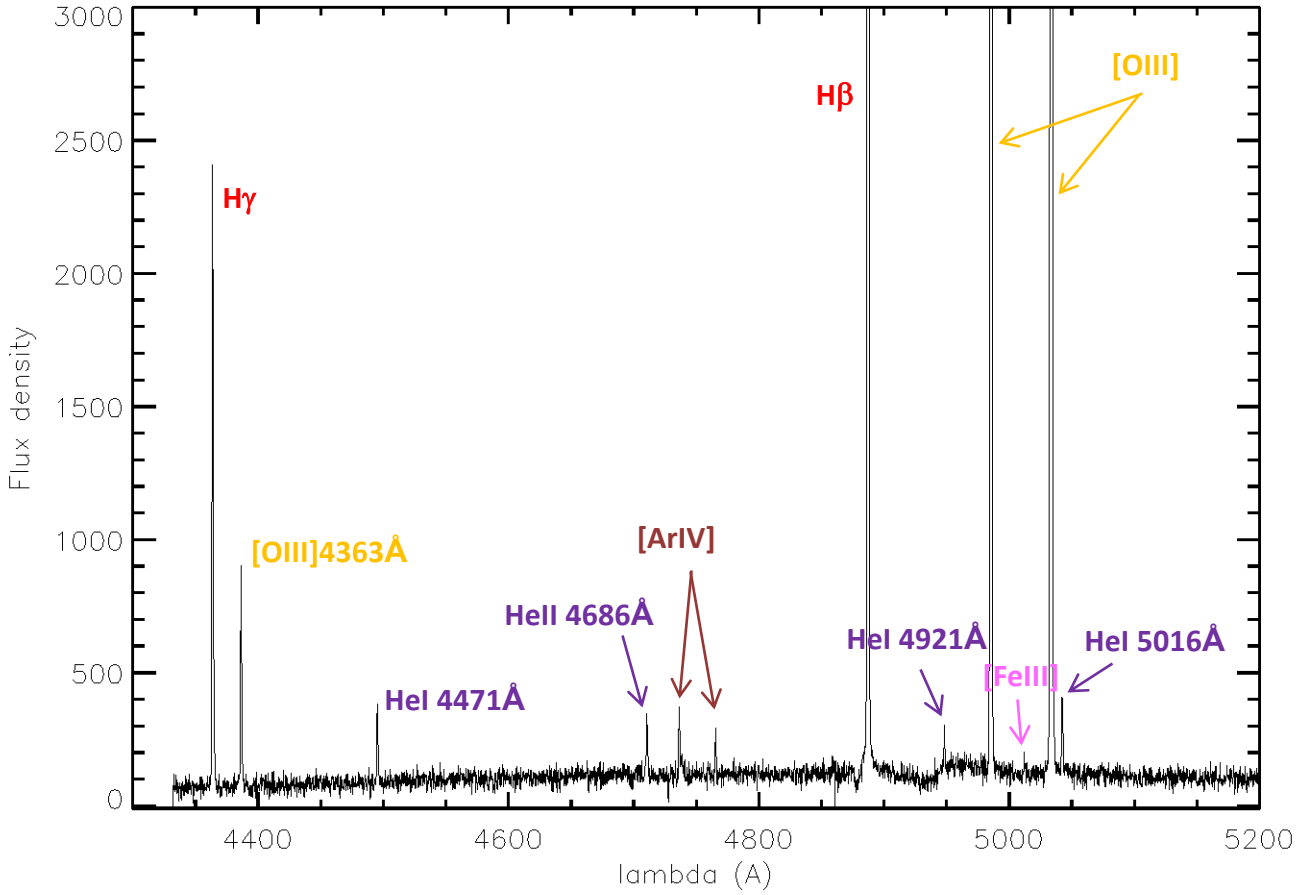


HR-R


7 fibers
Hα
[NII]6583Å
[NII]6548Å
Flux density
lambda (A)
0
100
200
300
400
6560
6580
6600
6620
6640

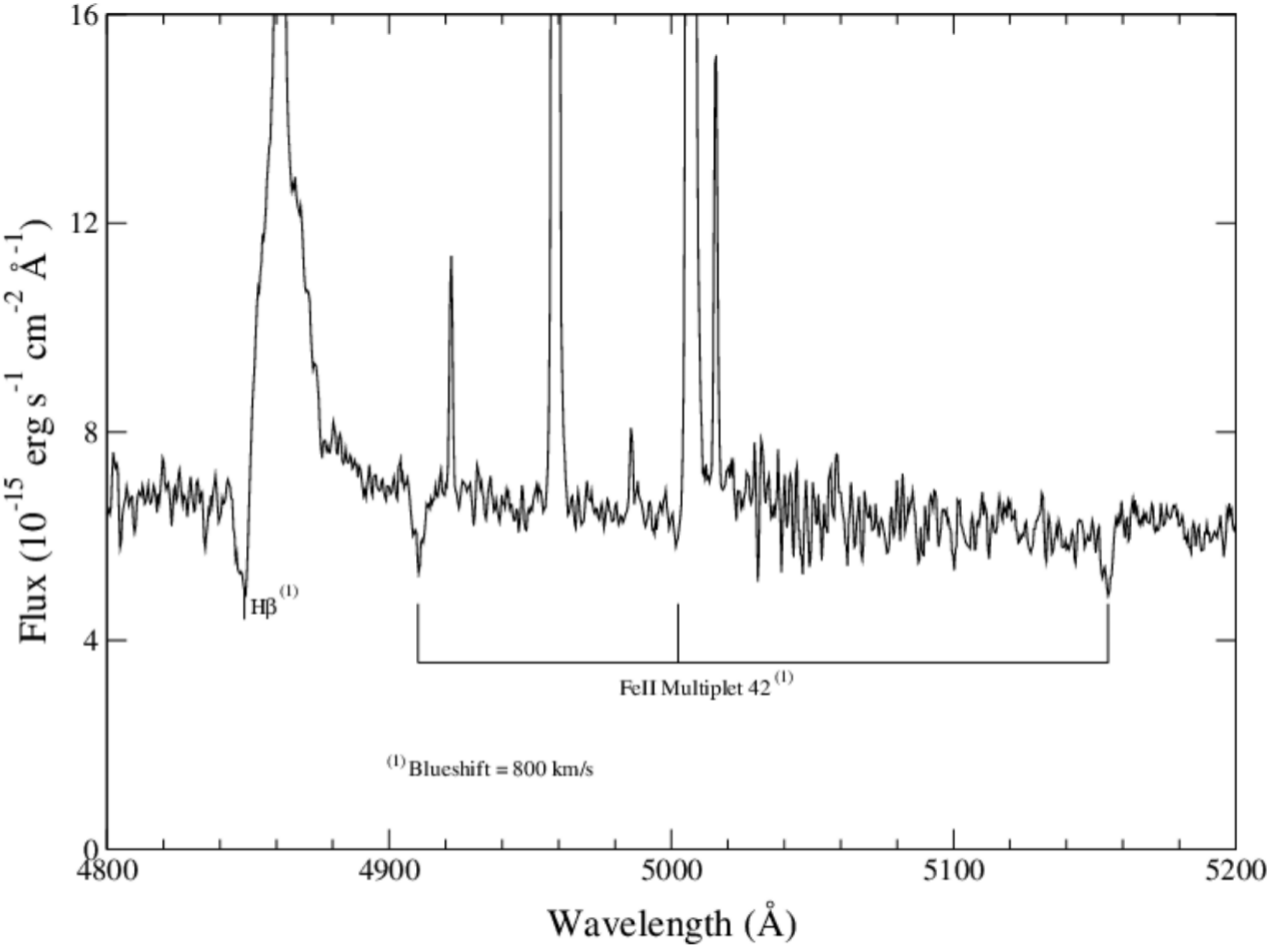
LR-B

7 fibers

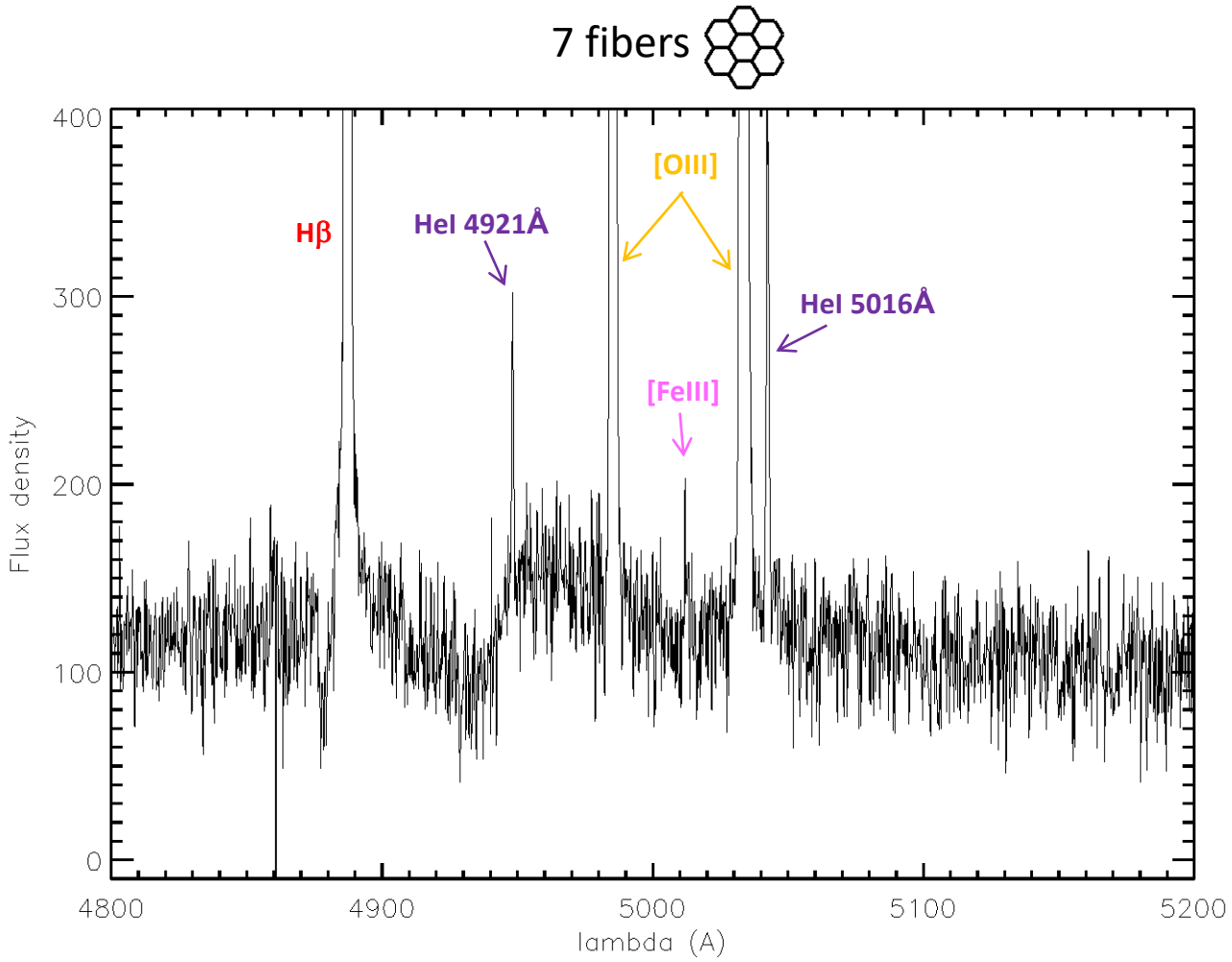

3000
2500
2000
1500
1000
500
0
Flux density
4400
4600
4800
5000
5200
lambda (A)
Hγ
Hβ
[OIII]
[OIII]4363Å
[ArIV]
HeII 4686Å
HeI 4471Å
HeI 4921Å
[FeIII]
HeI 5016Å

LR-B

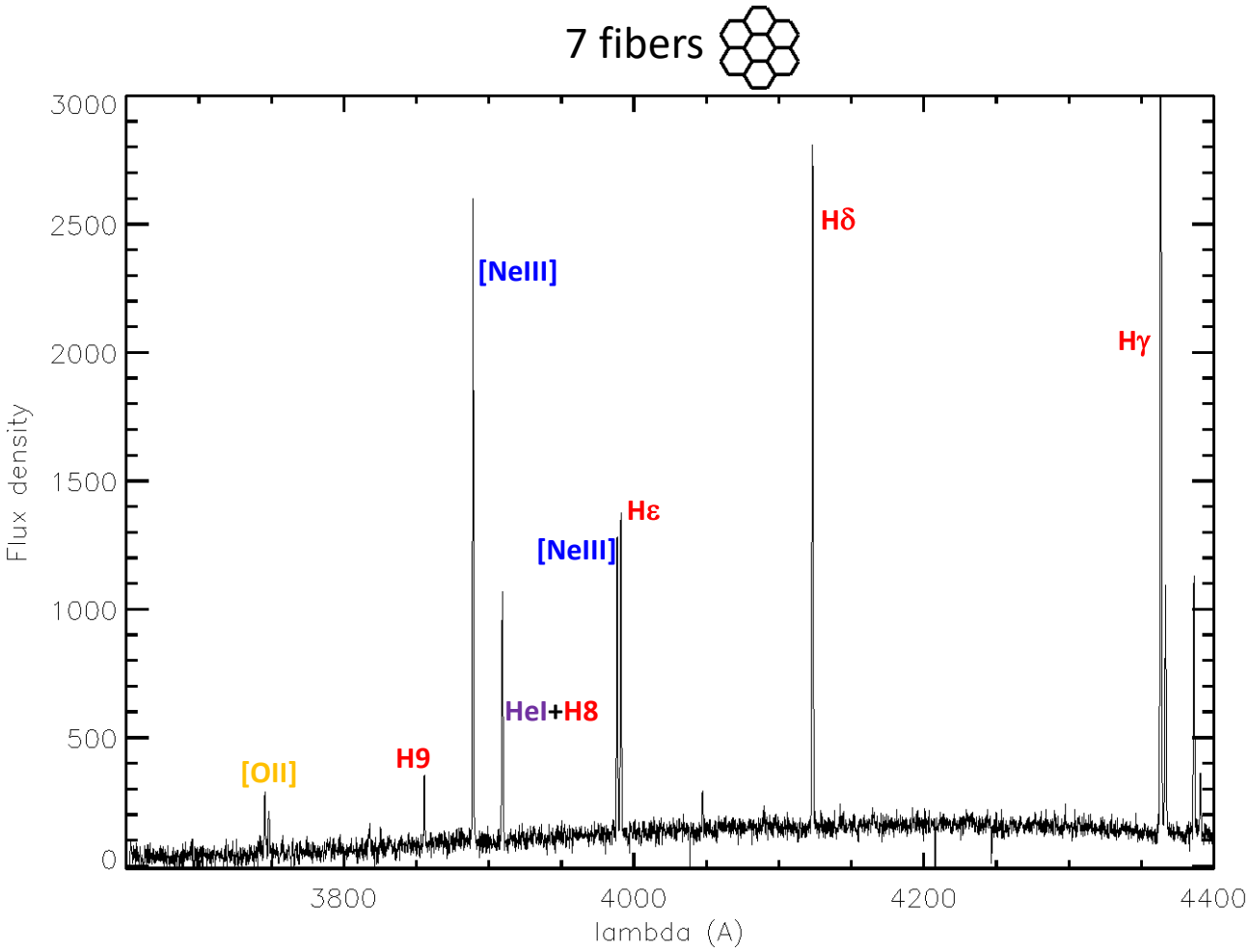
Terlevich+2014, X-Shooter



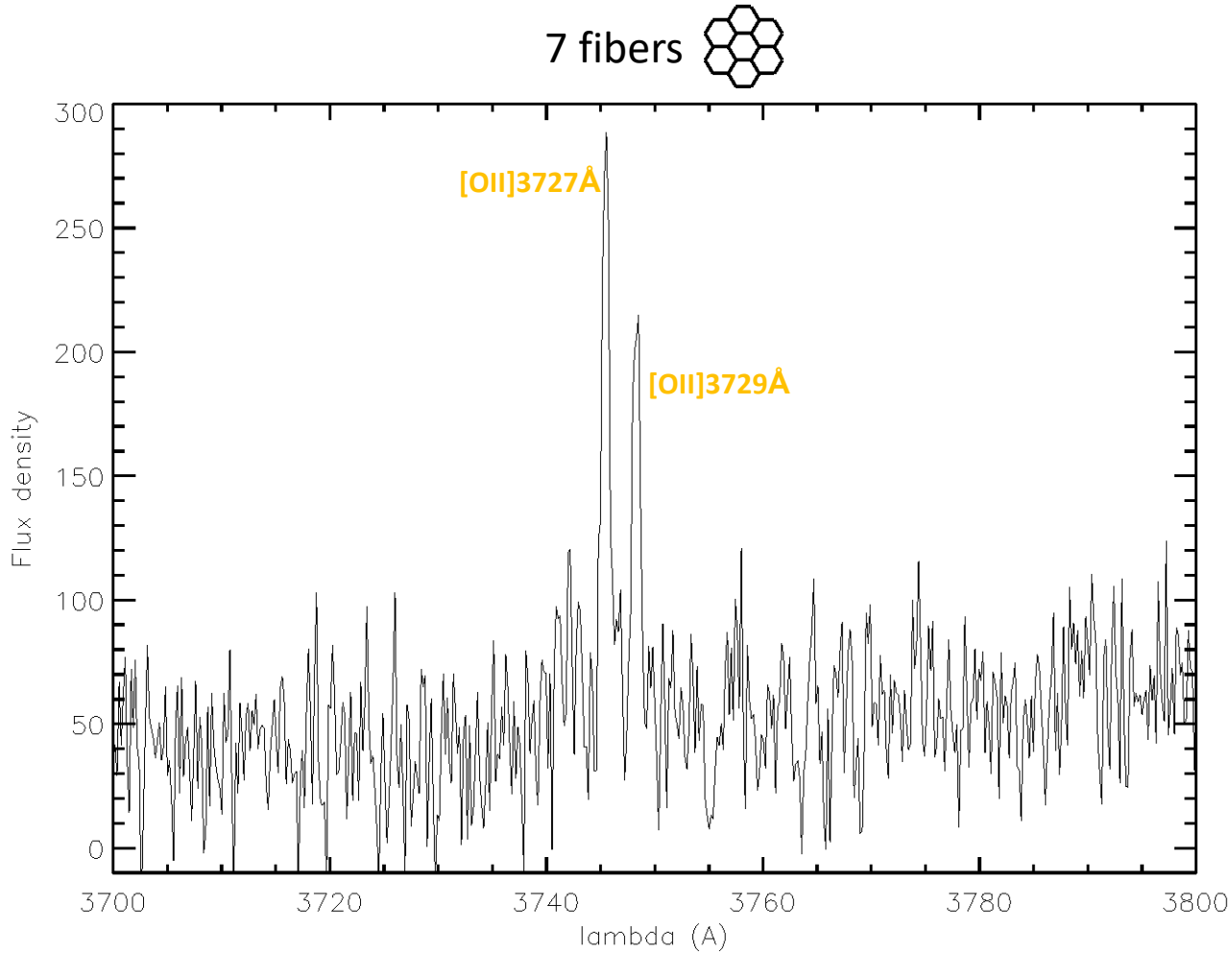
LR-B


7 fibers
Hβ
HeI 4921Å
[OIII]
HeI 5016Å
[FeIII]
Flux density
lambda (A)
400
300
200
100
0
4800
4900
5000
5100
5200

LR-U

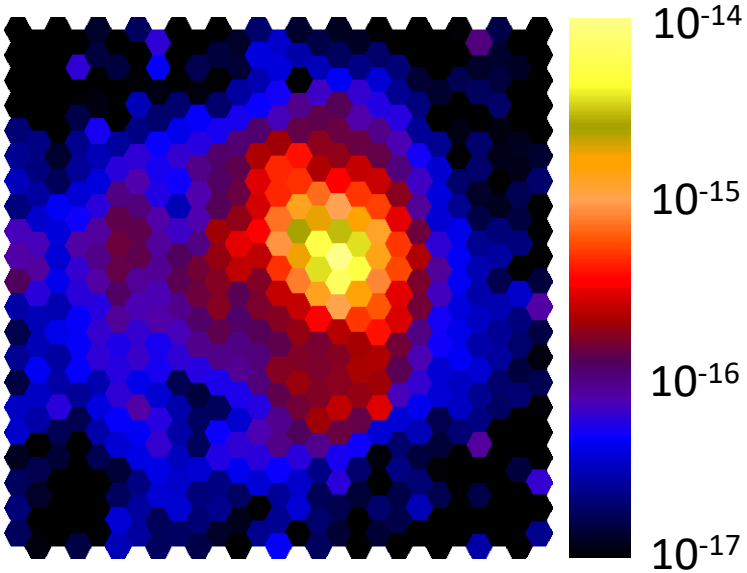

7 fibers
3000
2500
2000
1500
1000
500
0
Flux density
[OII]
H9
[NeIII]
HeI+H8
[NeIII]
Hε
Hδ
Hγ
3800
4000
4200
4400
lambda (A)

LR-U


7 fibers
[OII]3727Å
[OII]3729Å
Flux density
lambda (A)
300
250
200
150
100
50
0
3700
3720
3740
3760
3780
3800

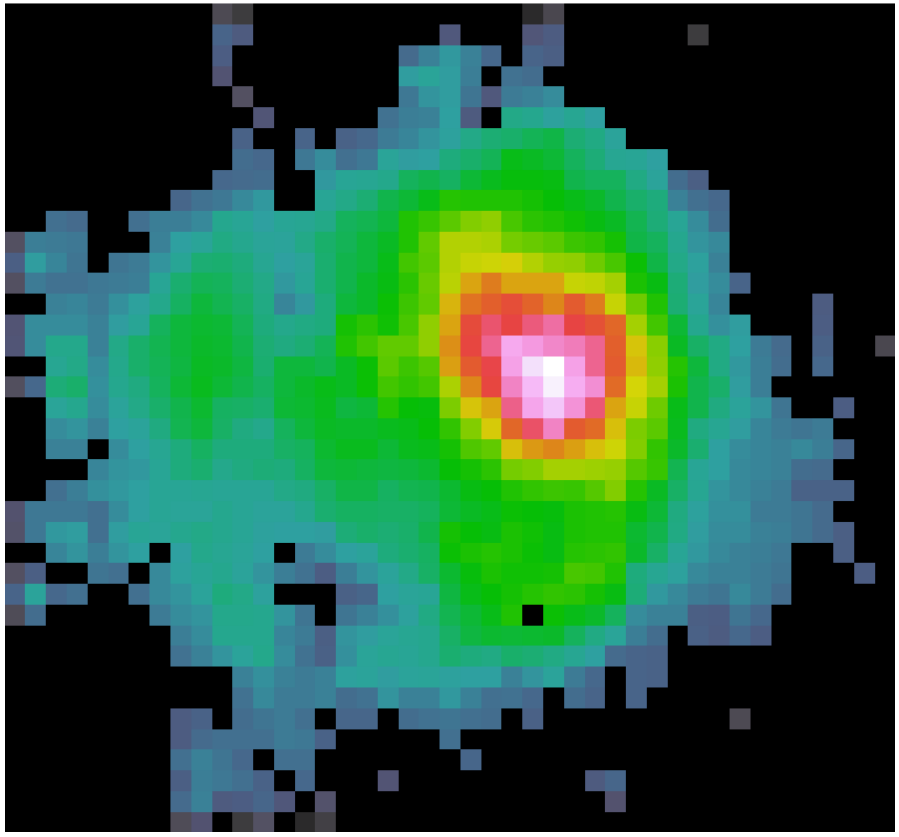
Results

Hα flux (gaussian fit)



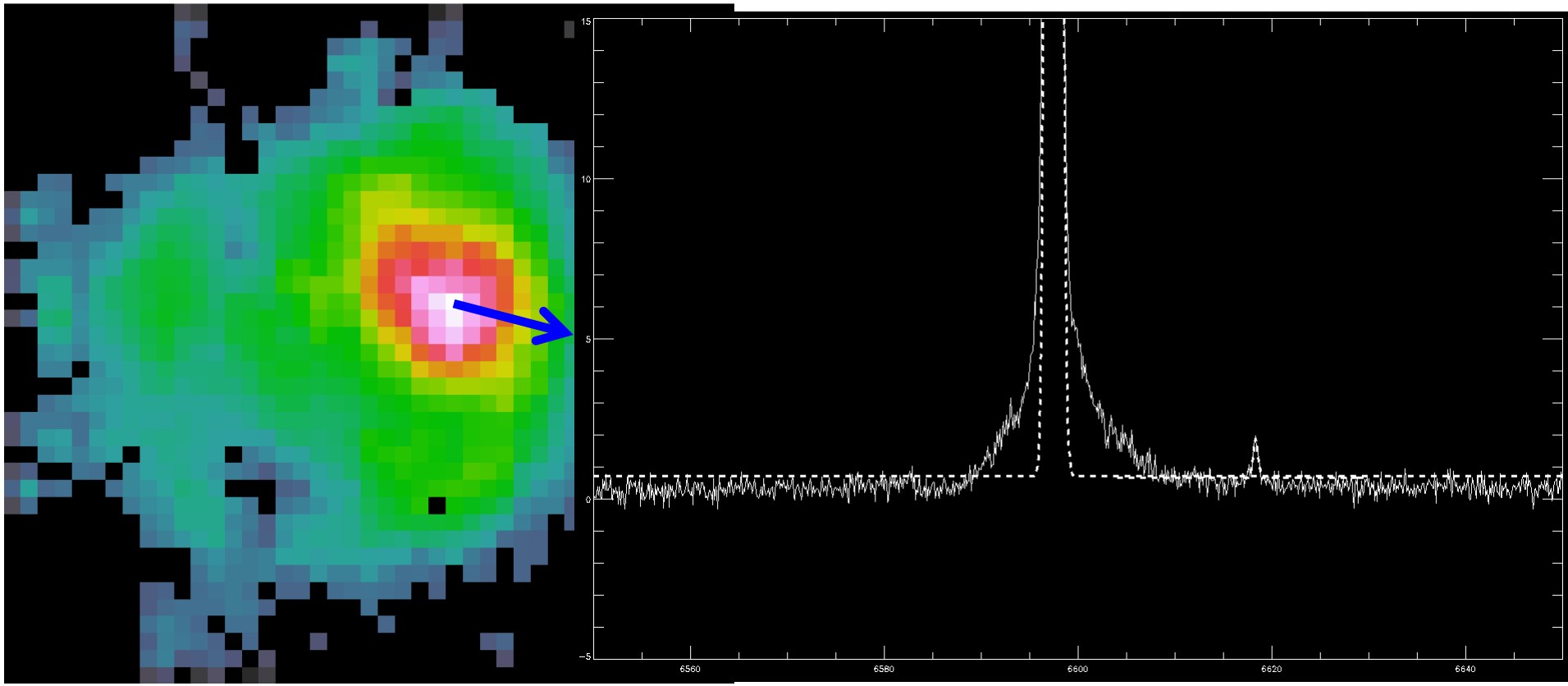
Hexagonal geometry

Cartesian geometry

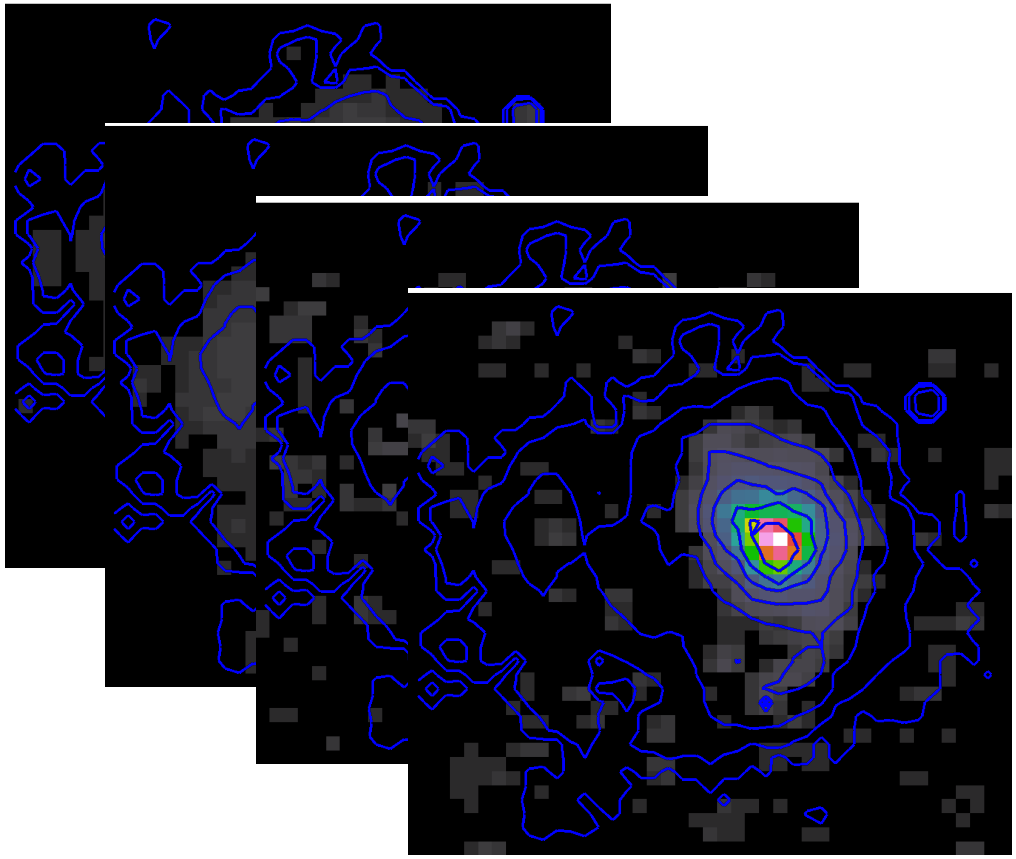


Results

Cartesian geometry



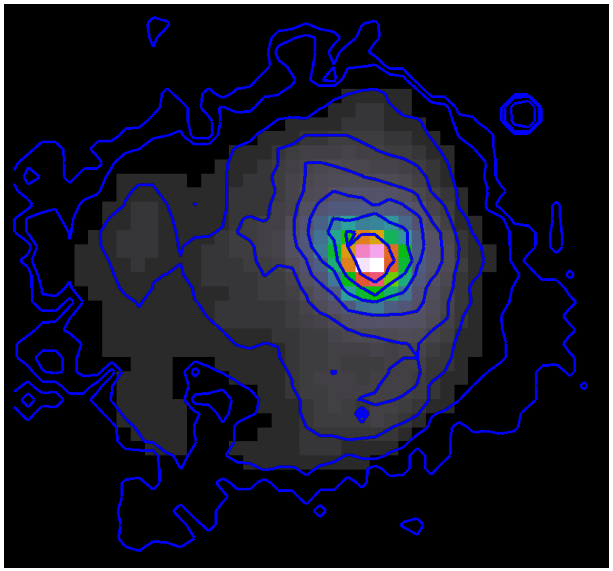
Results



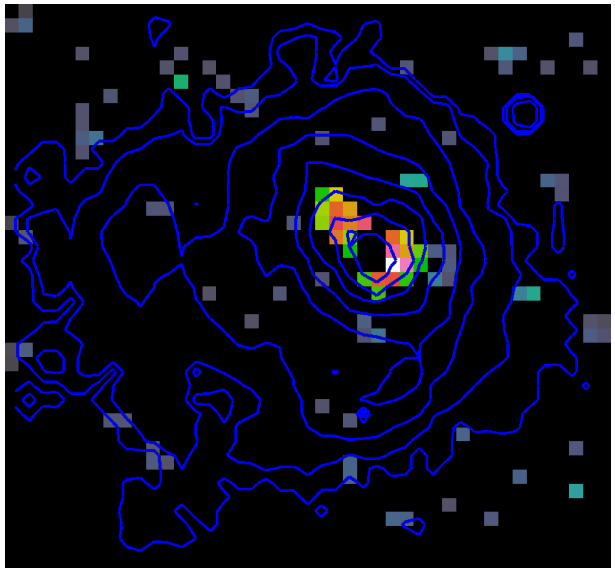
Hδ, LR-U

Recenter + align cubes of different setups with the Balmer emission line maps.

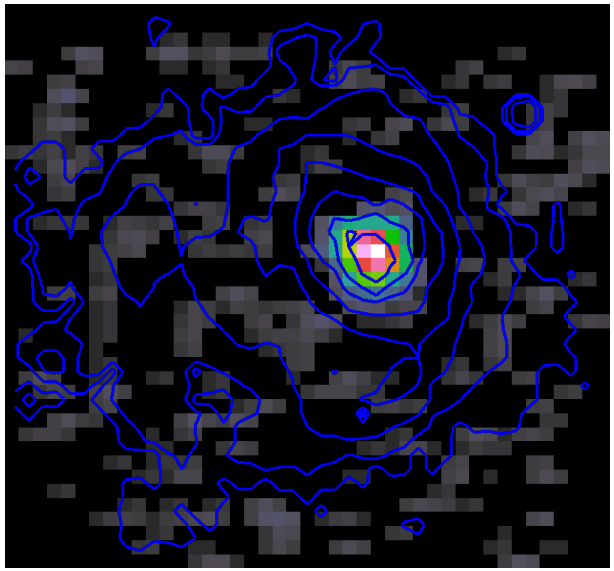
Results



[OIII]5007, LR-B



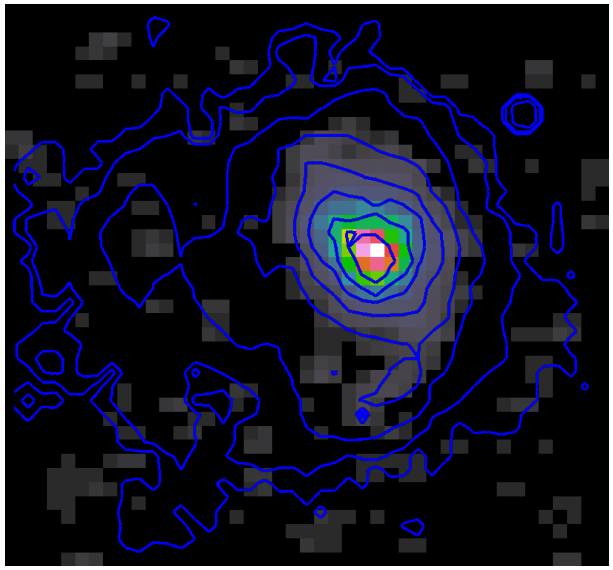
[NII]6583, HR-R



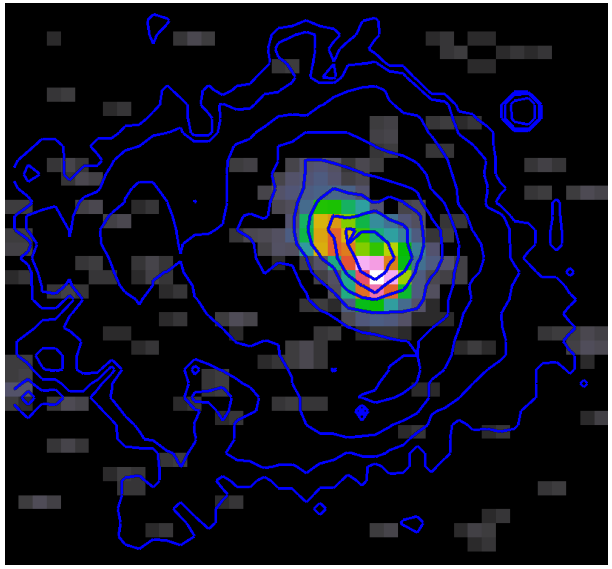
[OIII]4363, LR-B

Useful for abundance issues, BPT…

Results



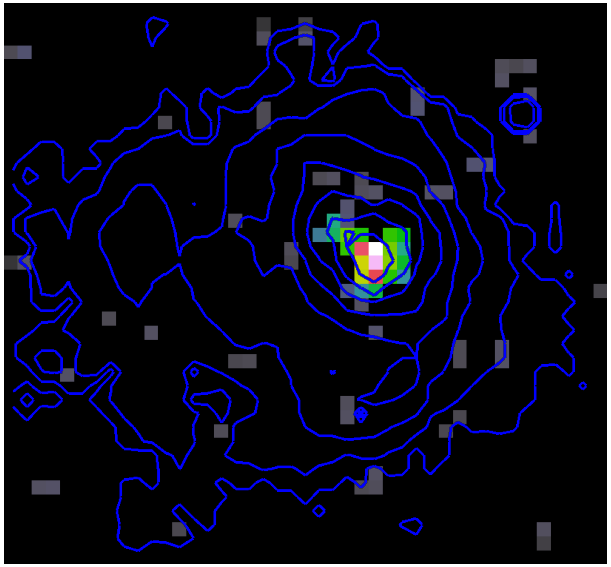
[OII]3727+3729, LR-U



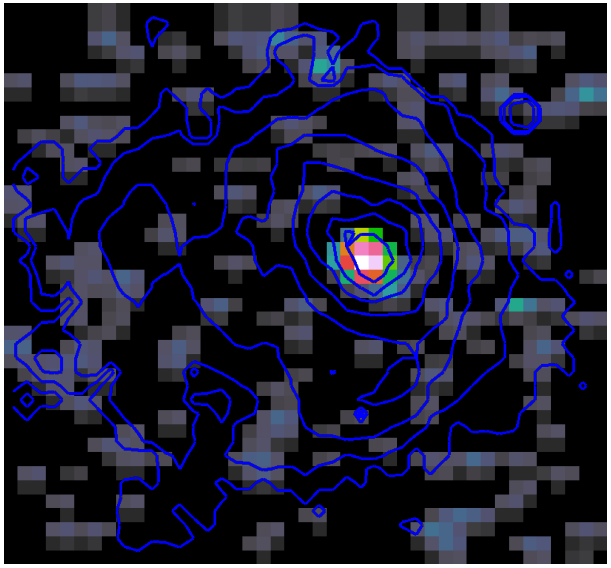
[SII]6717+6731, HR-R

Useful for density estimations (+ ionization parameter)

Results



HeI6678, HR-R



HeII4686, LR-B

Useful for He abundances (+ pop-III star siblings?
Kehrig et al. 2015)

Conclusions

High spectral resolution (6000 - 20000) IFU + MOS with complete coverage [3700,9600]Å.

Optimal for faint emission lines (at high resolution the contrast increases).

BCDs are ideal targets to perform detailed spatial studies + photoionization models.