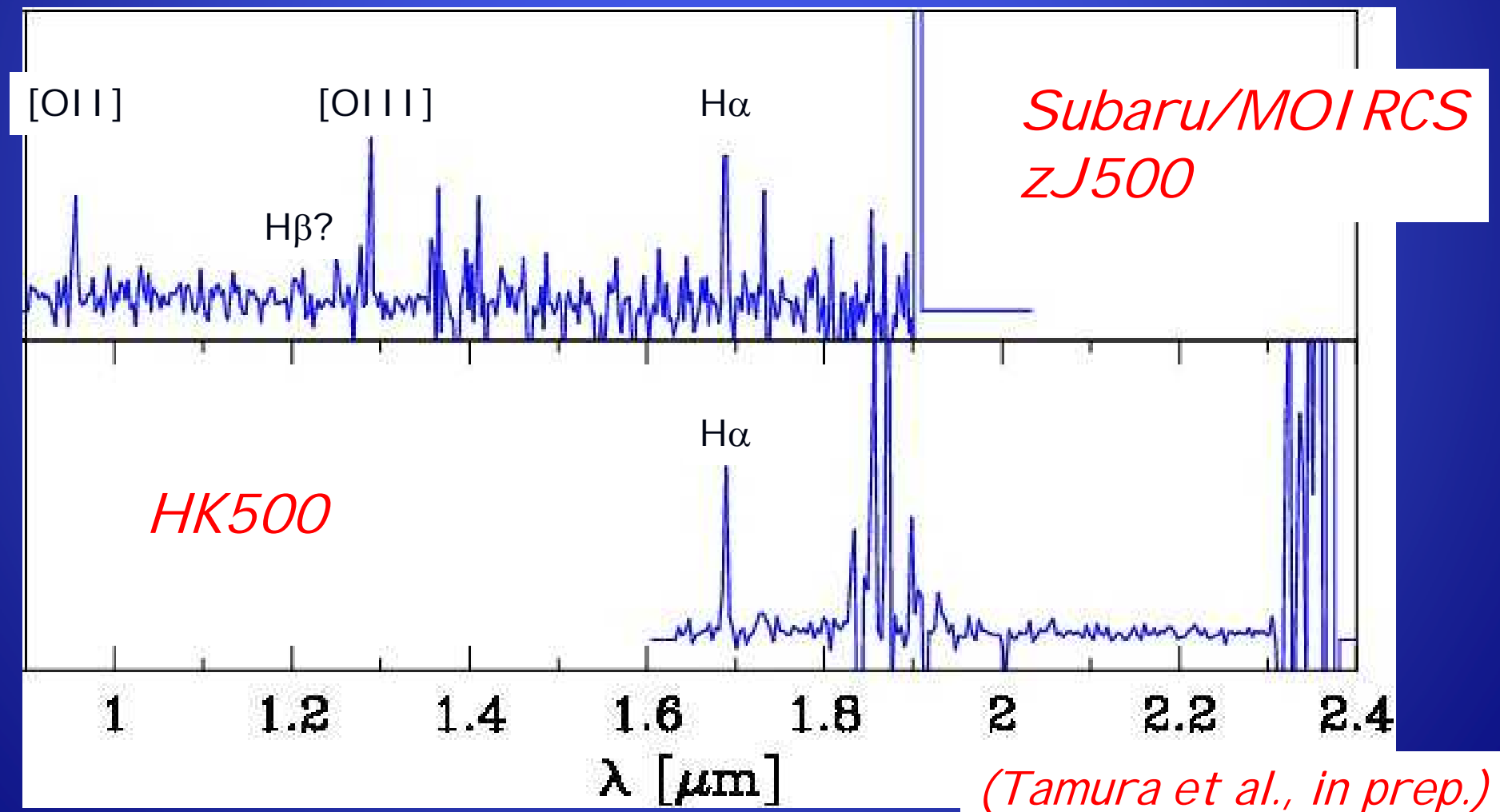


Now that FMOS is about to start working, it's time to dig out & re-clarify the reason why I thought I wanted to join the FMOS project 10 years ago ...

*sBzK, K=19.5, z(spec) = 1.54*



*(Tamura et al., in prep.)*

# "SCDXT"

Wide-field study of galaxies at  $z=1-2$

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*Subaru/Suprime-Cam UKI DSS/DXS*  
*Spitzer/SWIRE*

*~Ten deg<sup>2</sup> Opt/NIR/MIR imaging data*

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K. Ohta (Kyoto U.), N. Arimoto, T. Kodama, K. Sekiguchi,  
M. Kajisawa (NAOJ), Y. Taniguchi (Ehime U.), K. Umetsu  
(ASI AA/Taiwan), T. Wada, H. Matsuhara (JAXA)

# The observation & data

“Follow-up” observation of the UKI DSS DXS fields with Subaru/Suprime-Cam.

## □ Fields

*Lockman Hole (LH) & ELAIS N1*

18 S-Cam FoVs ( $\sim 5 \text{ deg}^2$ ) on each.

## □ Observations & data

4 runs in 2004 & 2005

LH:  $B$  &  $i'$       ELAIS-N1:  $i'$

Exp.  $\sim 500 \times 6$  ( $B$ ),  $300 \times 5$  ( $i'$ )

Seeing  $\sim 0''.6 - 1''.2$  (med.  $\sim 0''.8 - 0''.9$ )

$B \sim 27$  mag,  $i' \sim 26$  mag (AB)

( $5 \sigma$ ,  $2'' \phi$  random apertures)

# On-going studies

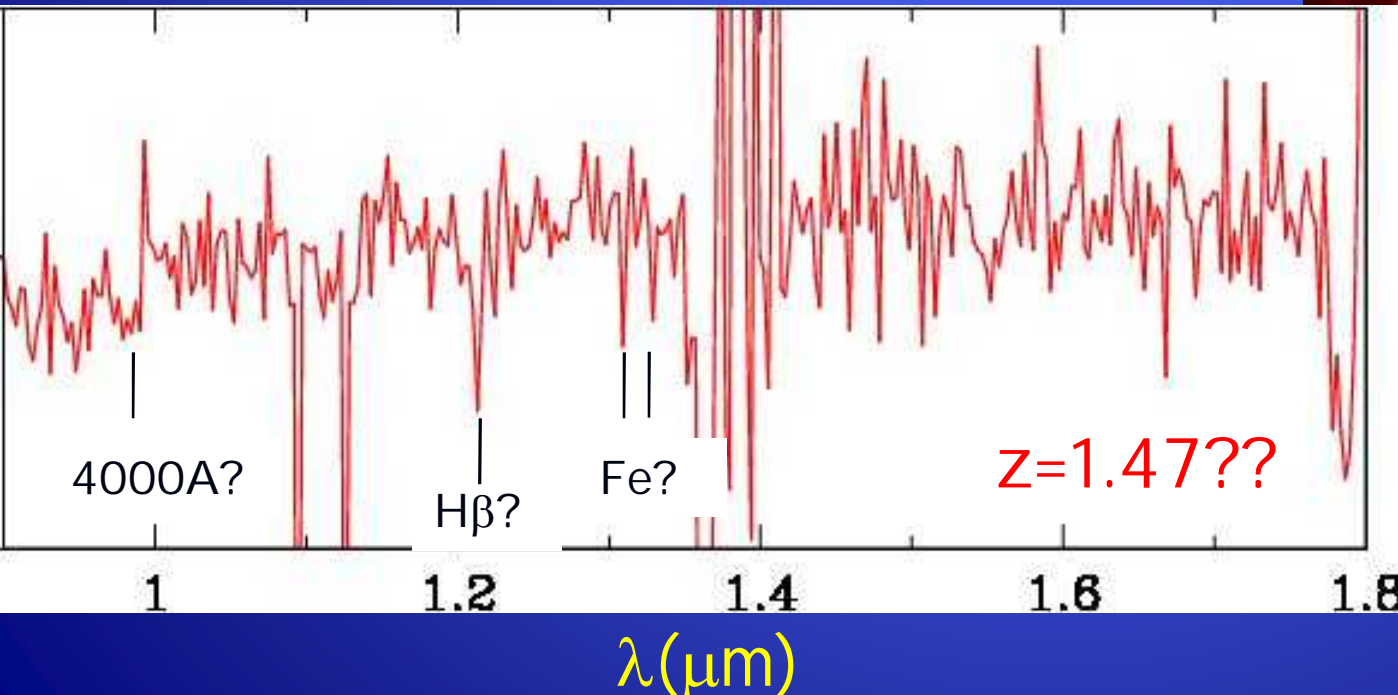
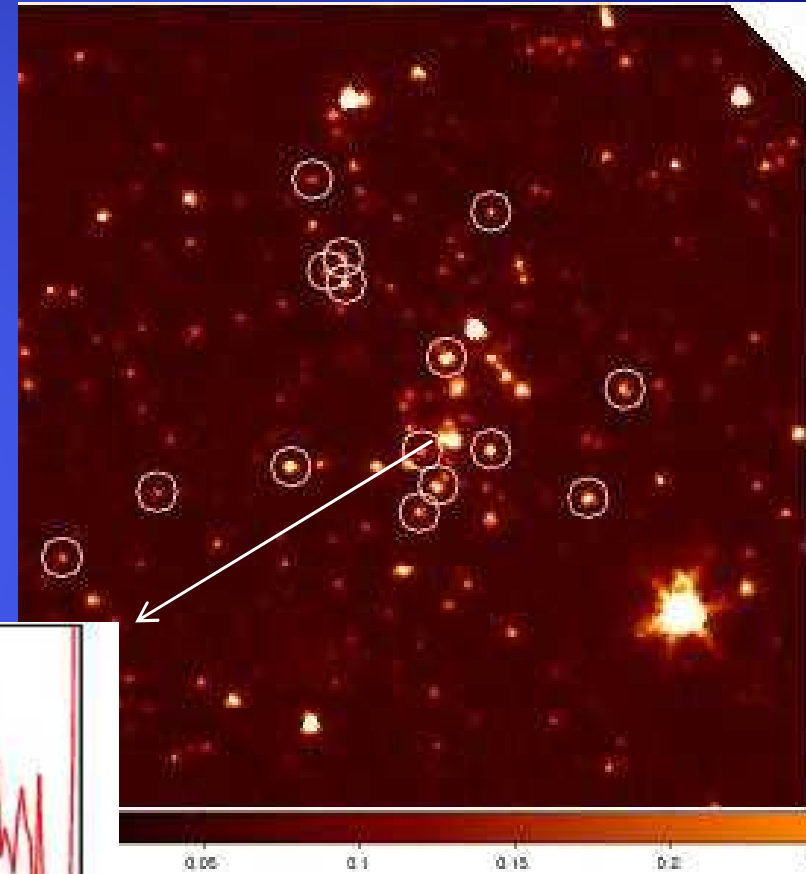
- Galaxy populations at  $z \sim 2$ 
  - Optical-NIR/MIR colour selection (+ photo- $z$ )
  - Search for distant clusters and even larger scale structures.
  - Environmental dependence of photometric properties of galaxies
  - Luminosity & stellar mass functions
  - ID of sources detected at other wavelengths
- Weak lensing analysis to search for mass selected galaxy clusters at  $z < 1$ .
  - *With redshift information of lensed galaxies.*

# High- $z$ ( $z > 1$ ) cluster search [1]

(T. Yamada et al.)

Candidates for associations of old galaxies are searched based on  $i' - [3.6]$  &  $[3.8] - [4.5]$  colours.

IRAC selected:  $[3.6] < 20.5$  (AB)  
 $\rightarrow K(\text{Vega}) < \sim 19$

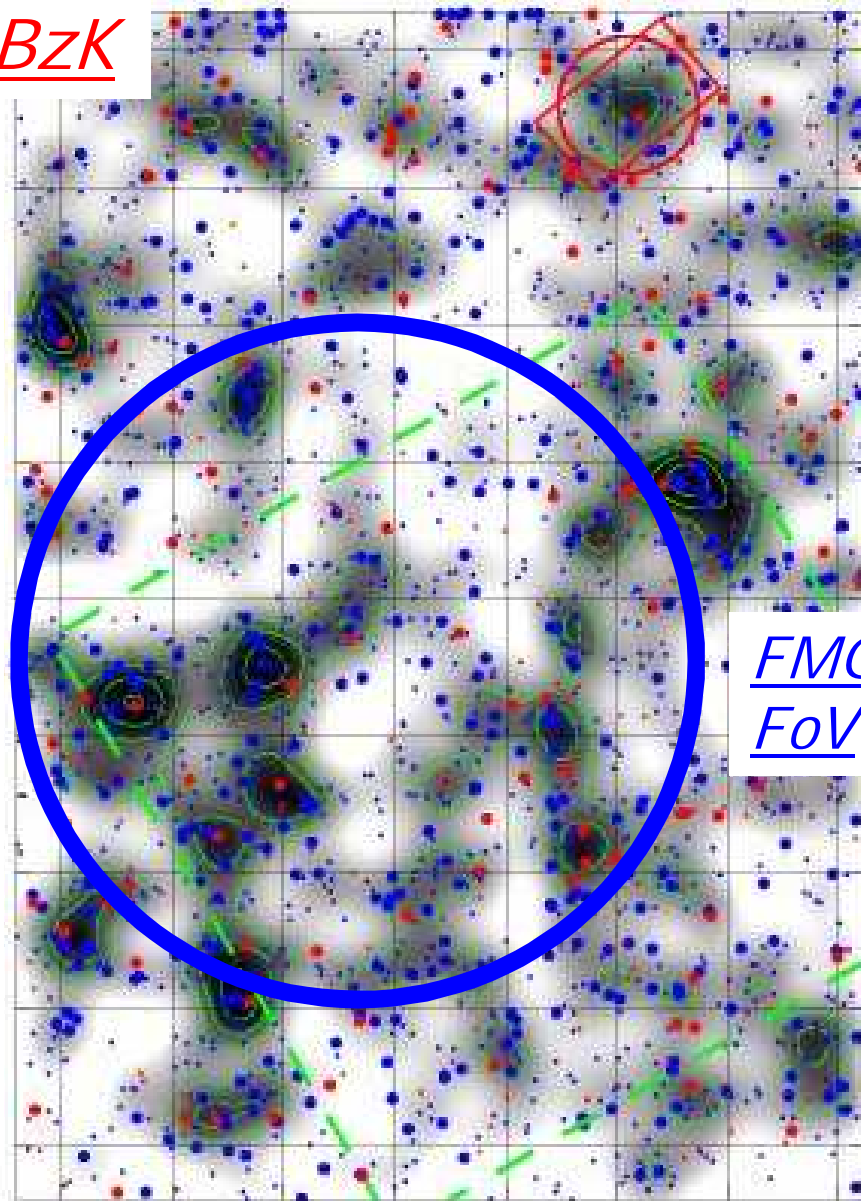


Subaru/MOIRCS  
zJ500  
 $K(\text{Vega}) \sim 16.5$   
80min integration  
through thin clouds...

# High- $z$ ( $z > 1$ ) cluster search [2] (N. Tamura et al.)

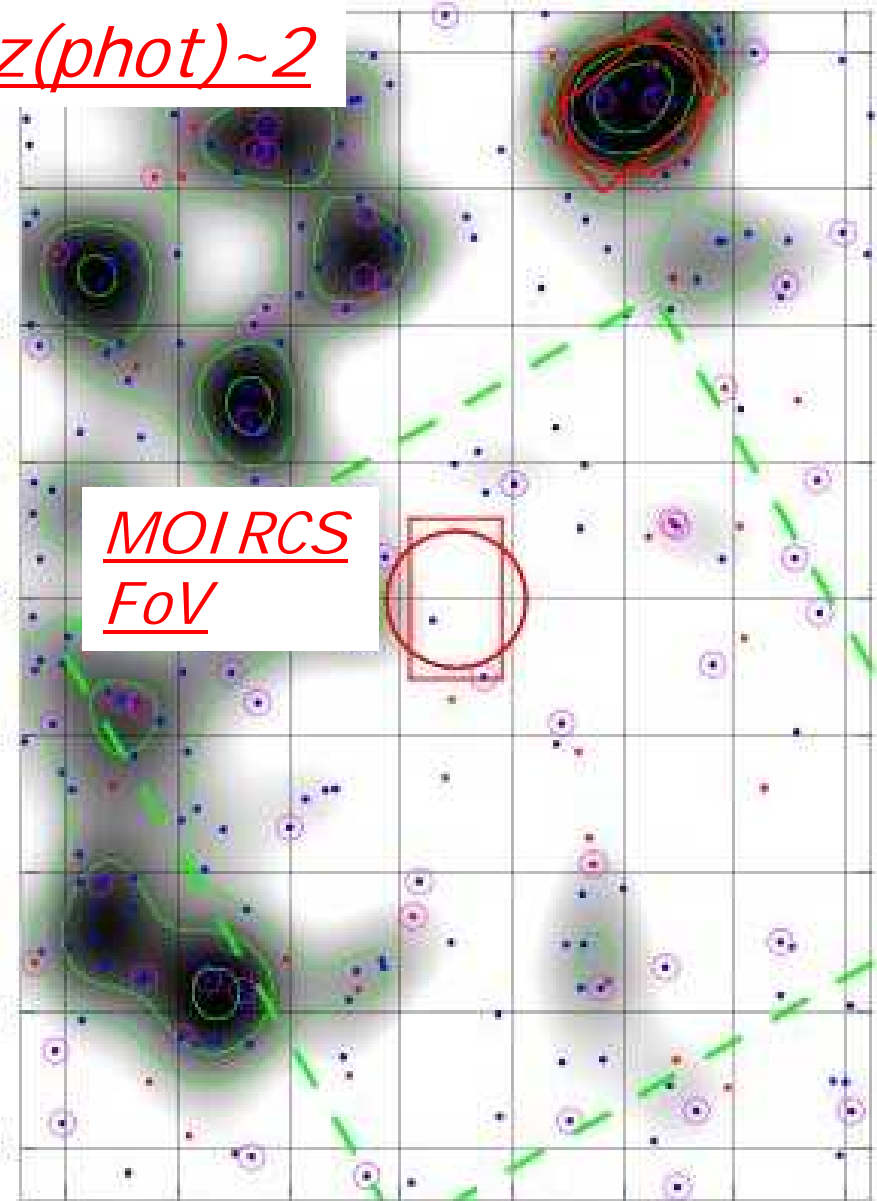
SE area of the LH field (w/ BRizJK)

BzK



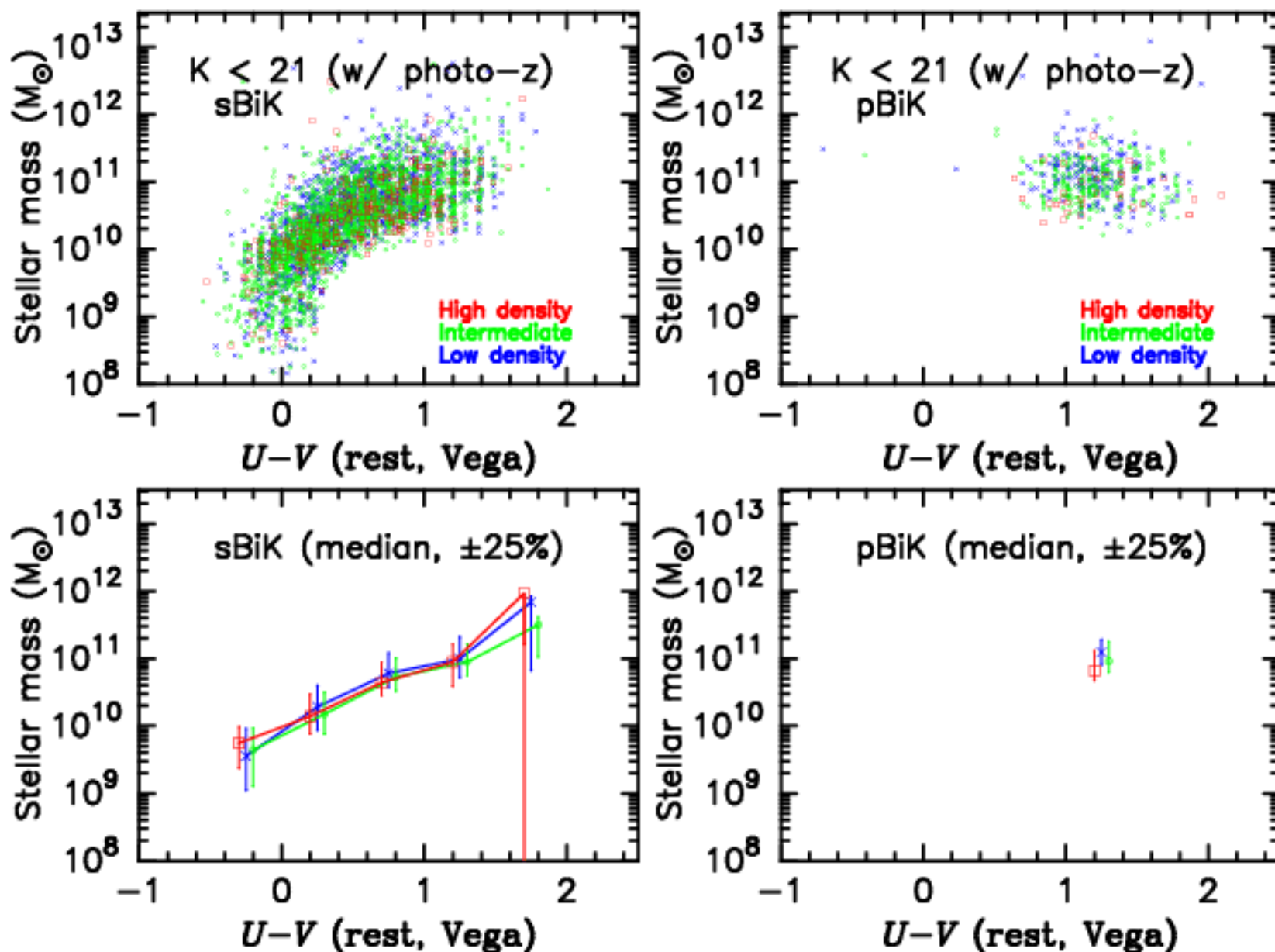
FMOS  
FoV

$z(\text{phot}) \sim 2$



MOIRCS  
FoV

# A statistical study for $z=1-2$ galaxy candidates

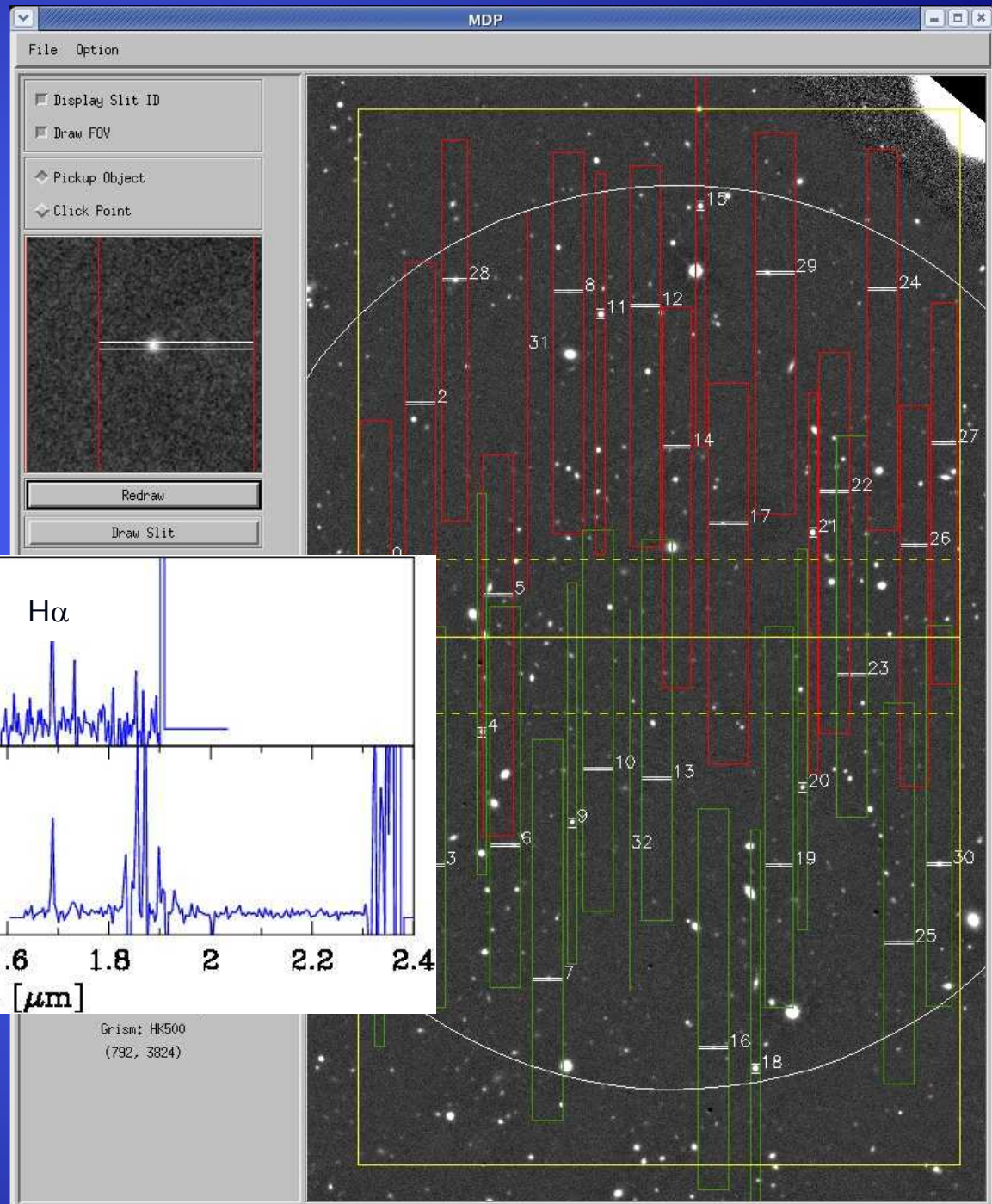
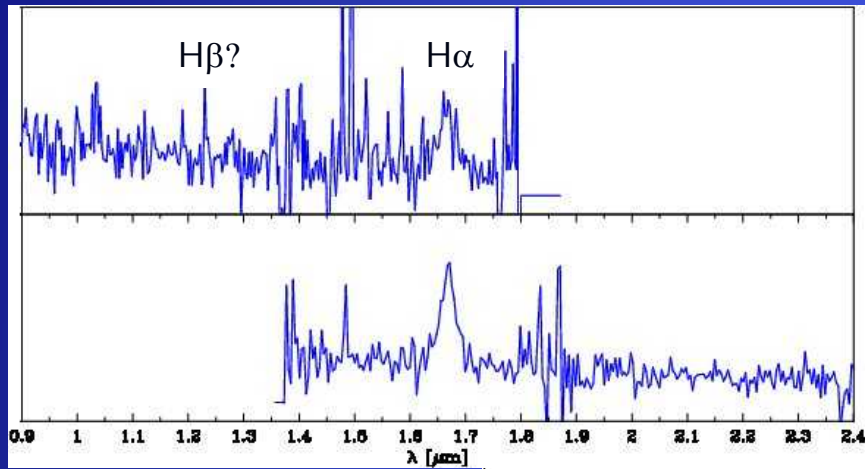


- Presence of red & massive star-forming galaxies
- Little or no environmental dependence?

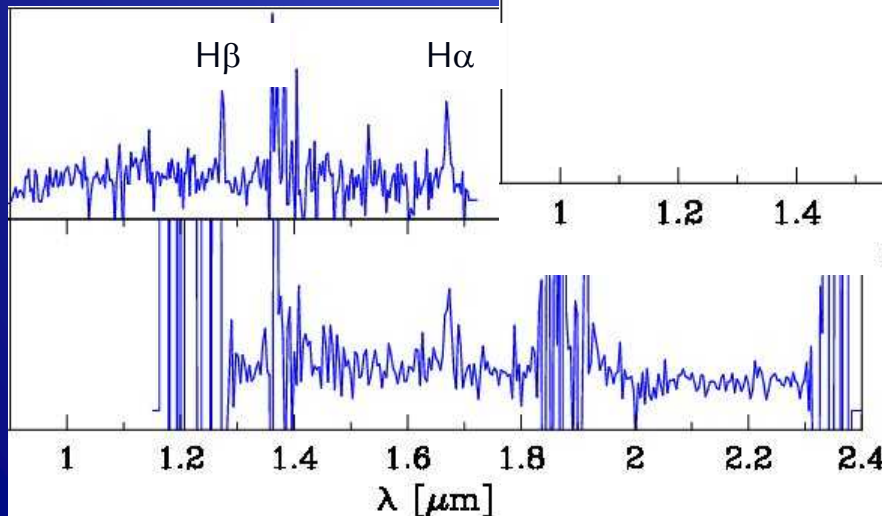
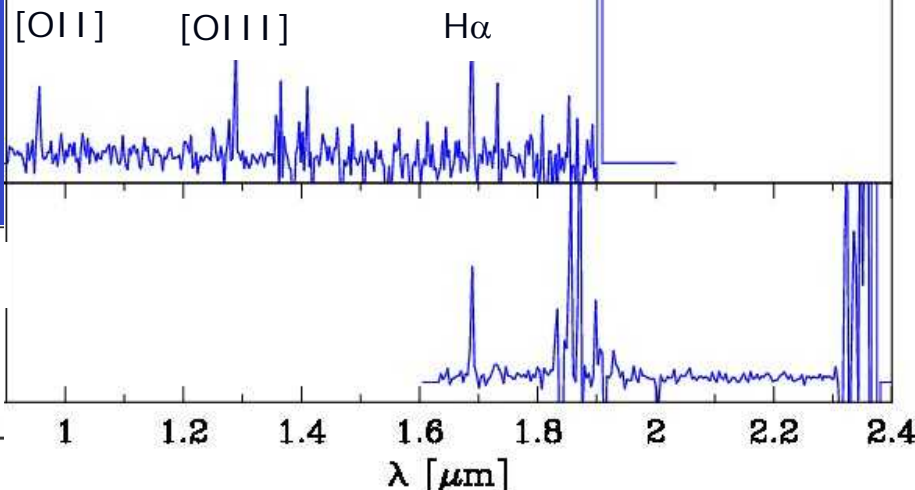


# Follow up with Subaru/MOI RCS → *FMOS*

- Distant cluster?
- Massive (s)BzK?



*(Tamura et al.,  
in prep.)*





# Some technical details

- Redshift confirmation

- Star formation rate

$M_s \sim 10^{11} M_{\text{sol}} \rightarrow \langle \text{SFR} \rangle \sim 100 M_s/\text{yr}$  (Daddi+ 07)

$H\beta$ ,  $z=2$ , no reddening  $\rightarrow 1.6 \times 10^{-16}$  cgs

Density: $K < 19$	$0.16 \text{ arcmin}^{-2}$ , $110 \text{ FoV}^{-1}$
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20	$0.31 \text{ arcmin}^{-2}$ , $220$
----	------------------------------------

21	$0.39 \text{ arcmin}^{-2}$ , $270$
----	------------------------------------

- Metallicity (R23,  $H\alpha/[NII]$ )

When  $H\beta$  is feasible,  $H\alpha$ ,  $[OII]3727$  &  $[OIII]5007$  can also be OK? ( $z$  range restricted however)

- Stacking analysis  $\rightarrow$  absorption lines?

Post-starburst features, stellar age/metallicity with an order of 100-hours net integration ...

# Goals with FMOS

- Characterizing “biased” galaxy samples at  $z=1-3$  (e.g. BzK, BiK, iERO) and their relationships based on spectroscopy across a large area overcoming cosmic variance.
- Systematic search of galaxy clusters at  $z = 1 - 2$  and census of galaxy property as a function of environment (*Any post-starburst galaxies? Where??*)
- Mass metallicity relation & specific SFR of *massive star-forming galaxies at  $z=1-2$*