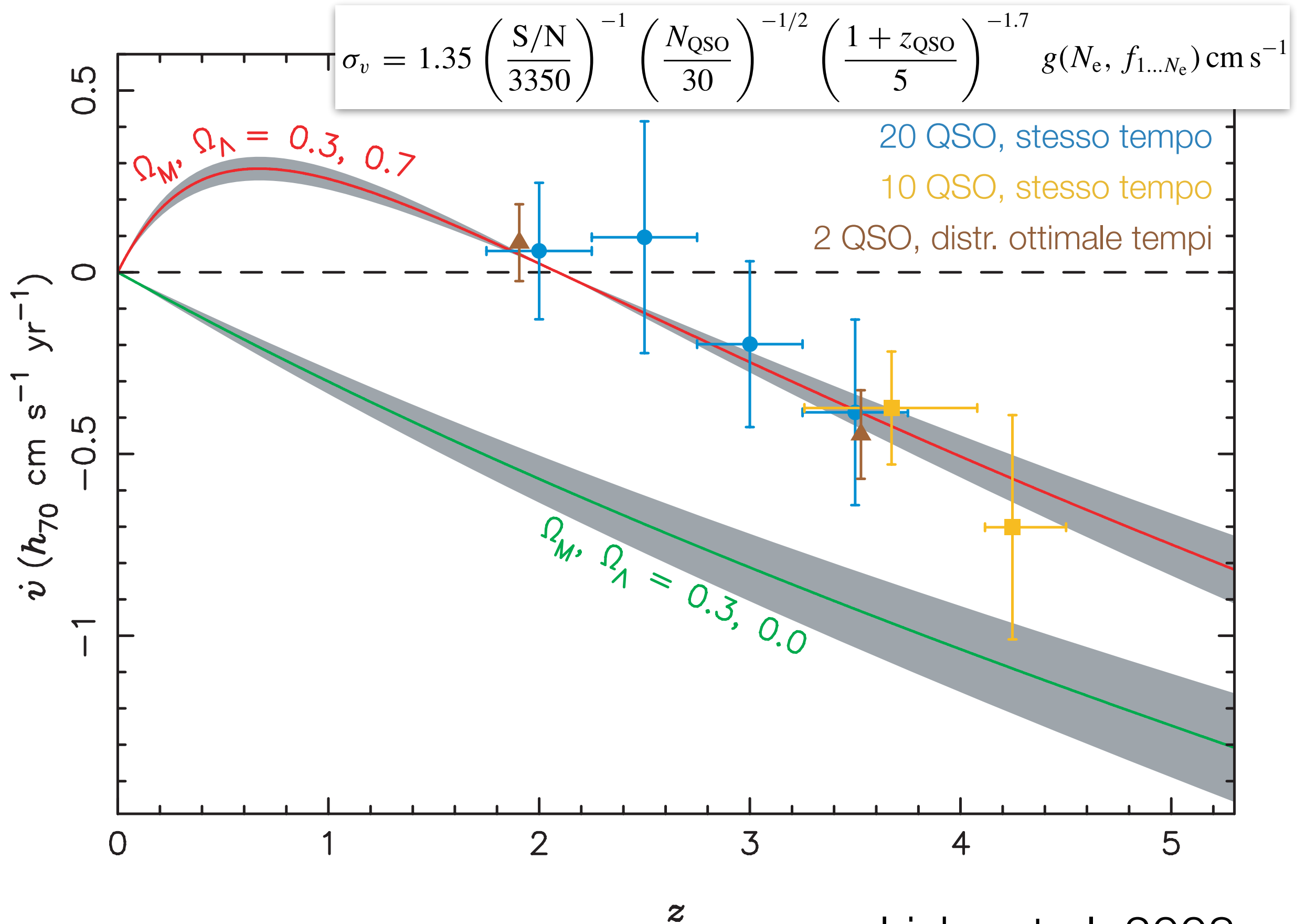


SOFTWARE SCIENTIFICO PER HIRES@E-ELT

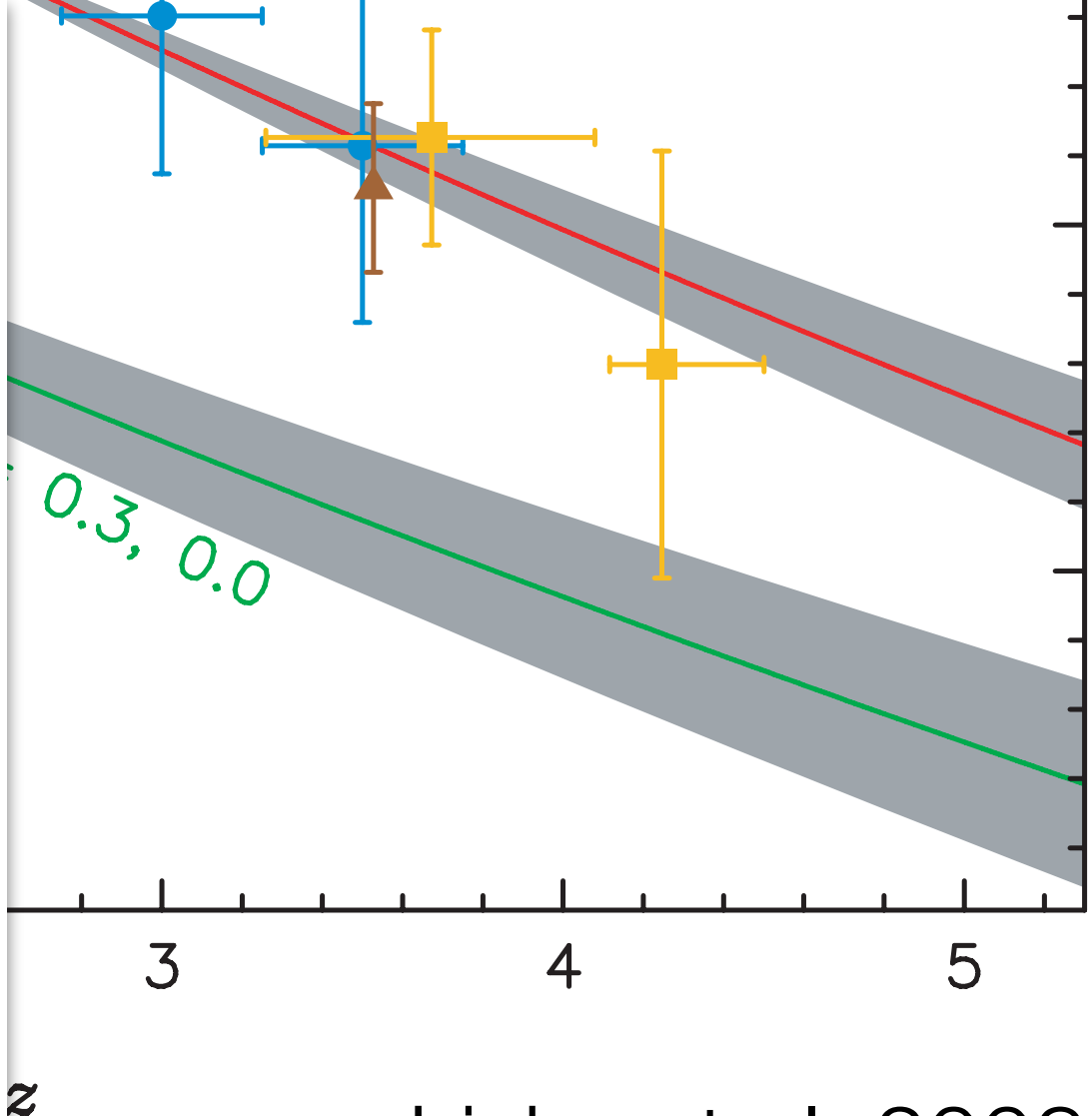
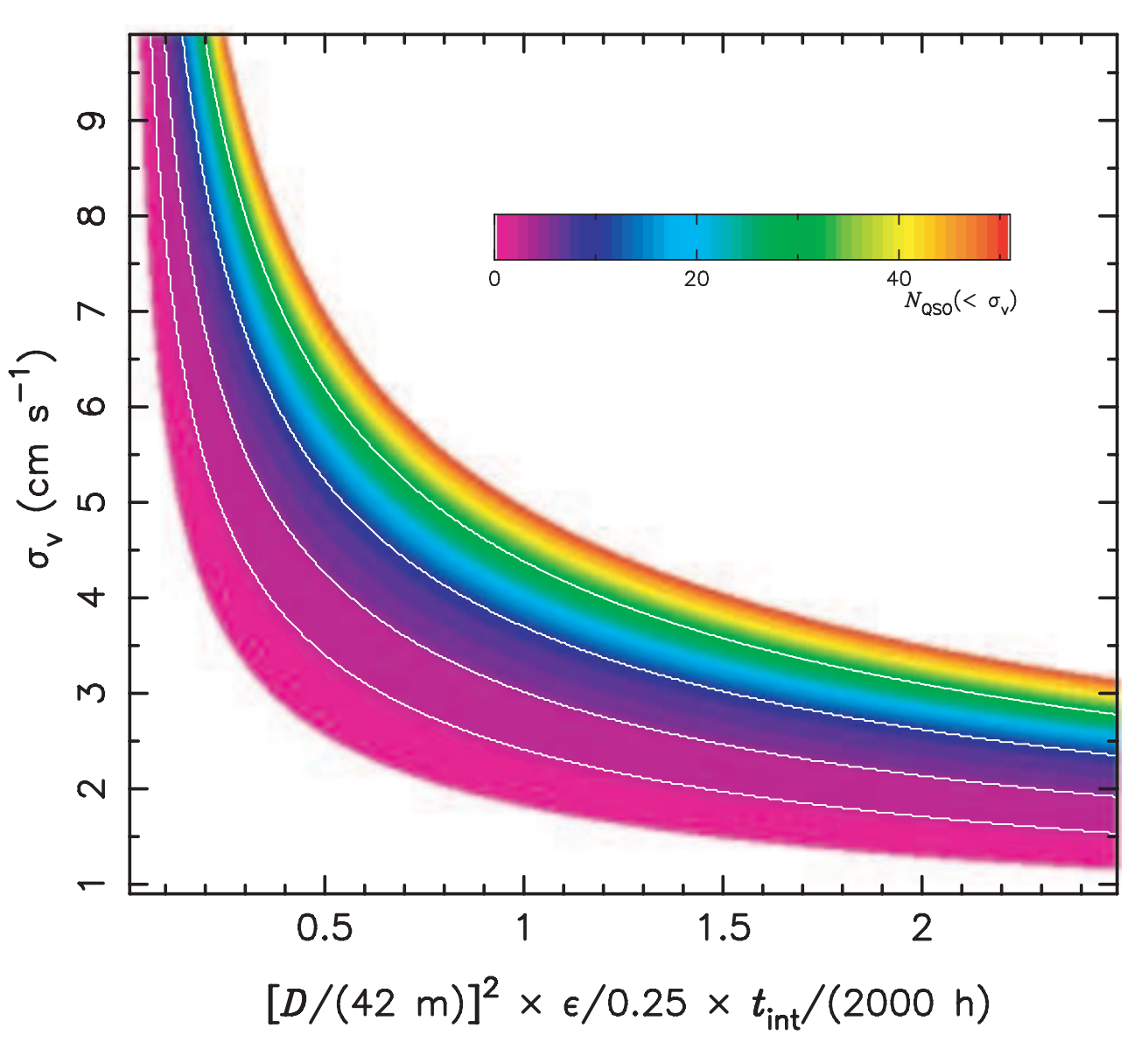
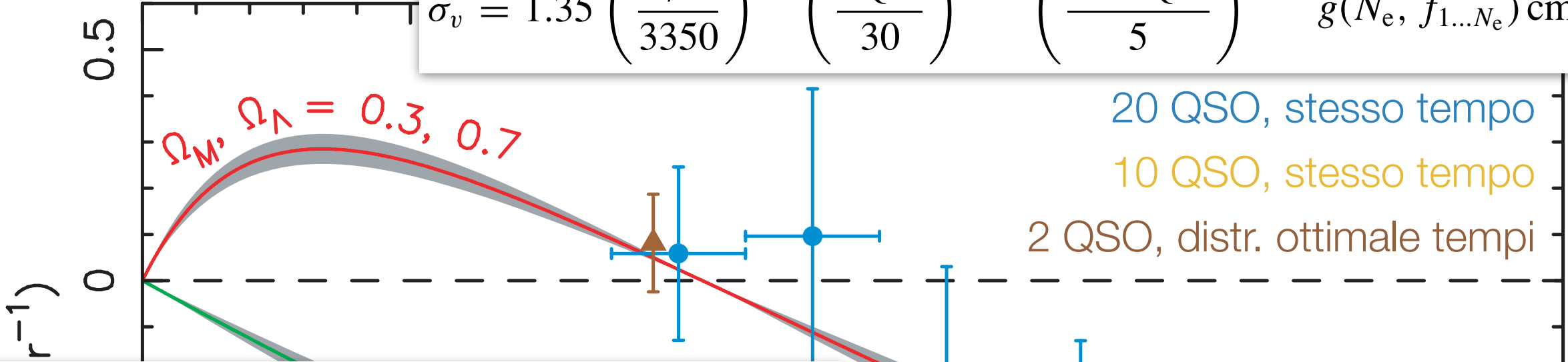


Guido Cupani, INAF-OATs (con Valentina D'Odorico, Stefano Cristiani)
Riunione informativa sul progetto HIRES / INAF-OAR, 15 giugno 2015

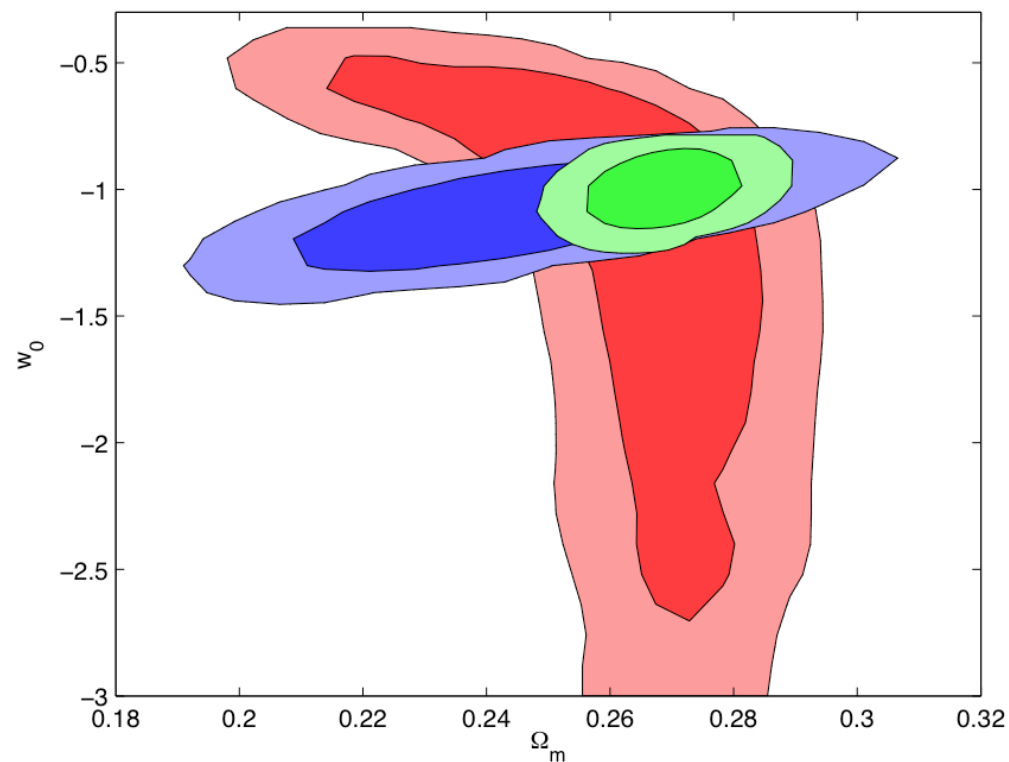


Liske et al. 2008

$$\sigma_v = 1.35 \left(\frac{S/N}{3350} \right)^{-1} \left(\frac{N_{\text{QSO}}}{30} \right)^{-1/2} \left(\frac{1+z_{\text{QSO}}}{5} \right)^{-1.7} g(N_e, f_{1\dots N_e}) \text{ cm s}^{-1}$$



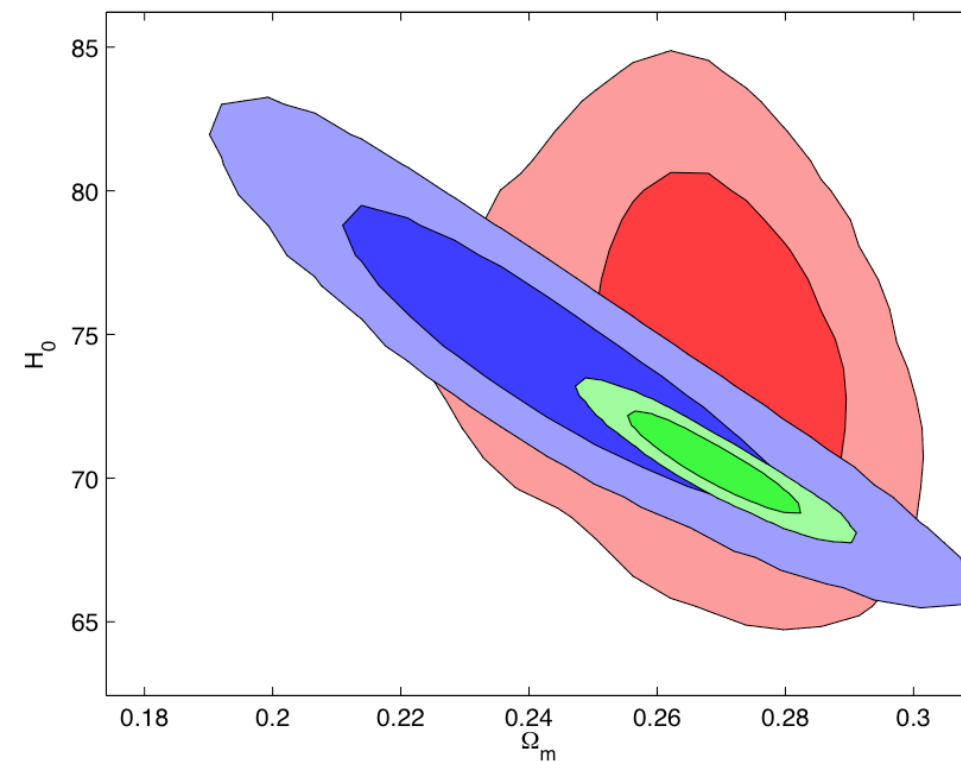
Liske et al. 2008



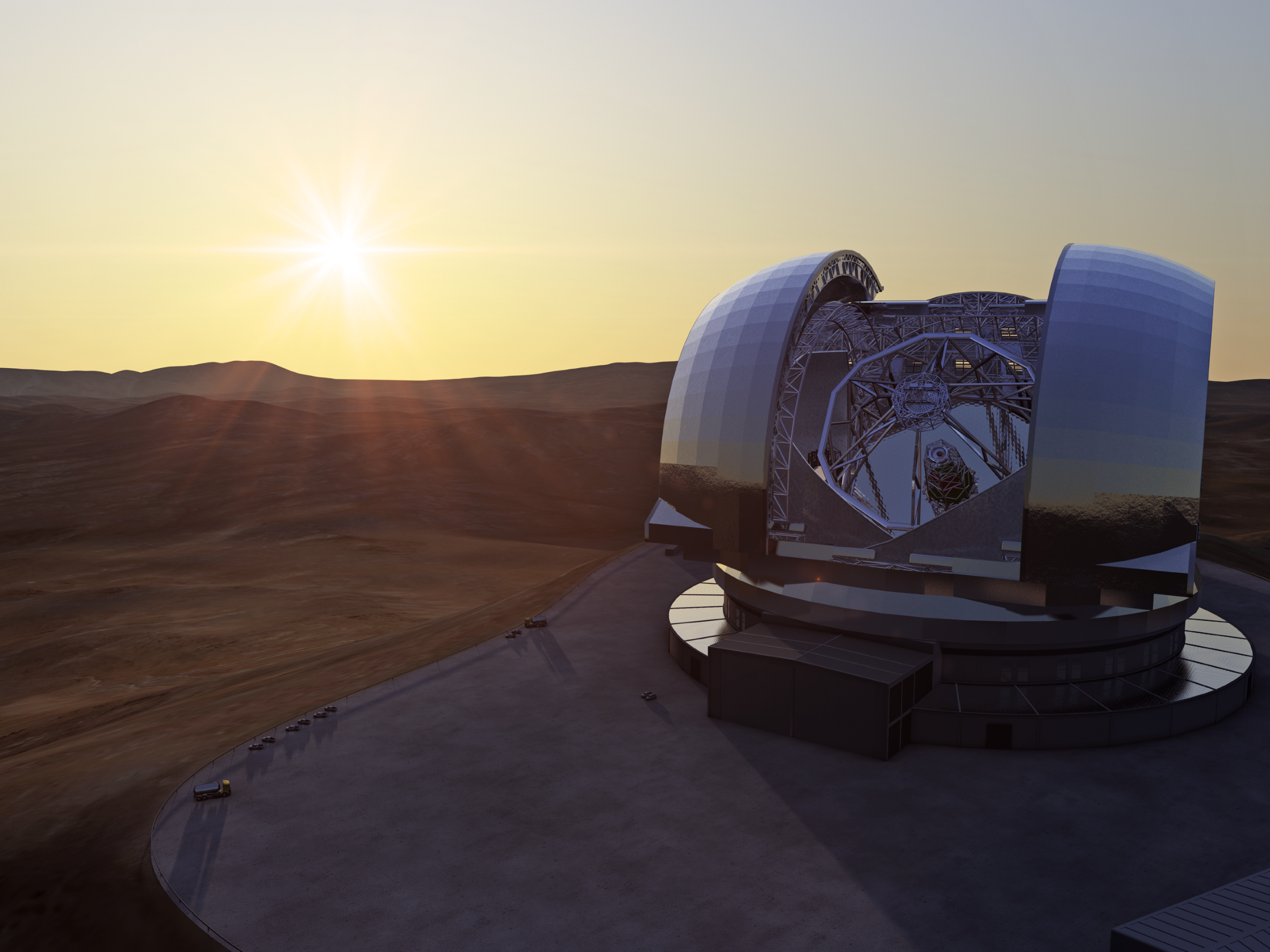
CMB

$$\frac{dz}{dt}$$

assieme



Science case		Spectral resolution ($\lambda/\Delta\lambda$)	Wavel. range (μm)	Wavel. accuracy (m s^{-1})	Stability (m s^{-1})	Multi-plex	Backgr. subtr.	AO / IFU	Polarim.
Fundamental constants & T(CMB)	E	80,000	0.37-0.67	2 (relative)	2 night^{-1}	none	not critical	no	no
	D	100,000	0.33-0.8	1 (relative)	1 night^{-1}	none	desirable	no	no
Deuterium abundance	E	50,000	0.37-0.7	50	not critical	none	not crit.	no	no
	D	100,000	0.33-1.0	50	not critical	none	<1% ^a	no	no
Sandage test	E	100,000	0.37-0.67	0.02 (absolute)	0.02 night^{-1}	none	not critical	no	no
	D	150,000	0.33-0.8	0.01 (absolute)	0.01 night^{-1}	none	desirable	no	no



ESPRESSO@VLT

$D = 8.2\text{--}16.4\text{ m}$

$R \sim 55\text{k--}200\text{k}$

$380\text{--}780\text{ nm}$

$\Delta v \sim 10\text{ cm s}^{-1}$

HIRES@E-ELT

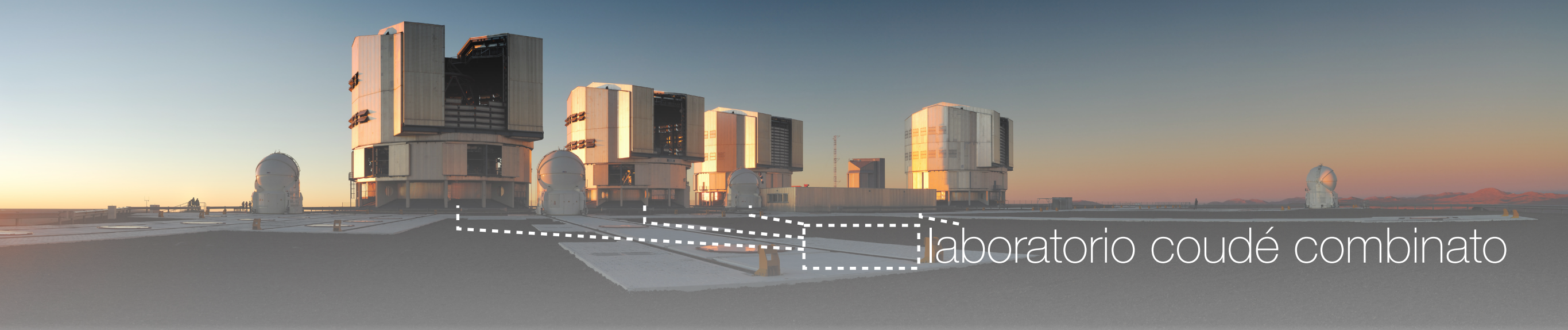
$D = 39.3\text{ m}$

$R \sim 14\text{k--}100\text{k}$

$400\text{--}2500\text{ nm}$

$\Delta v = 2\text{ cm s}^{-1}$

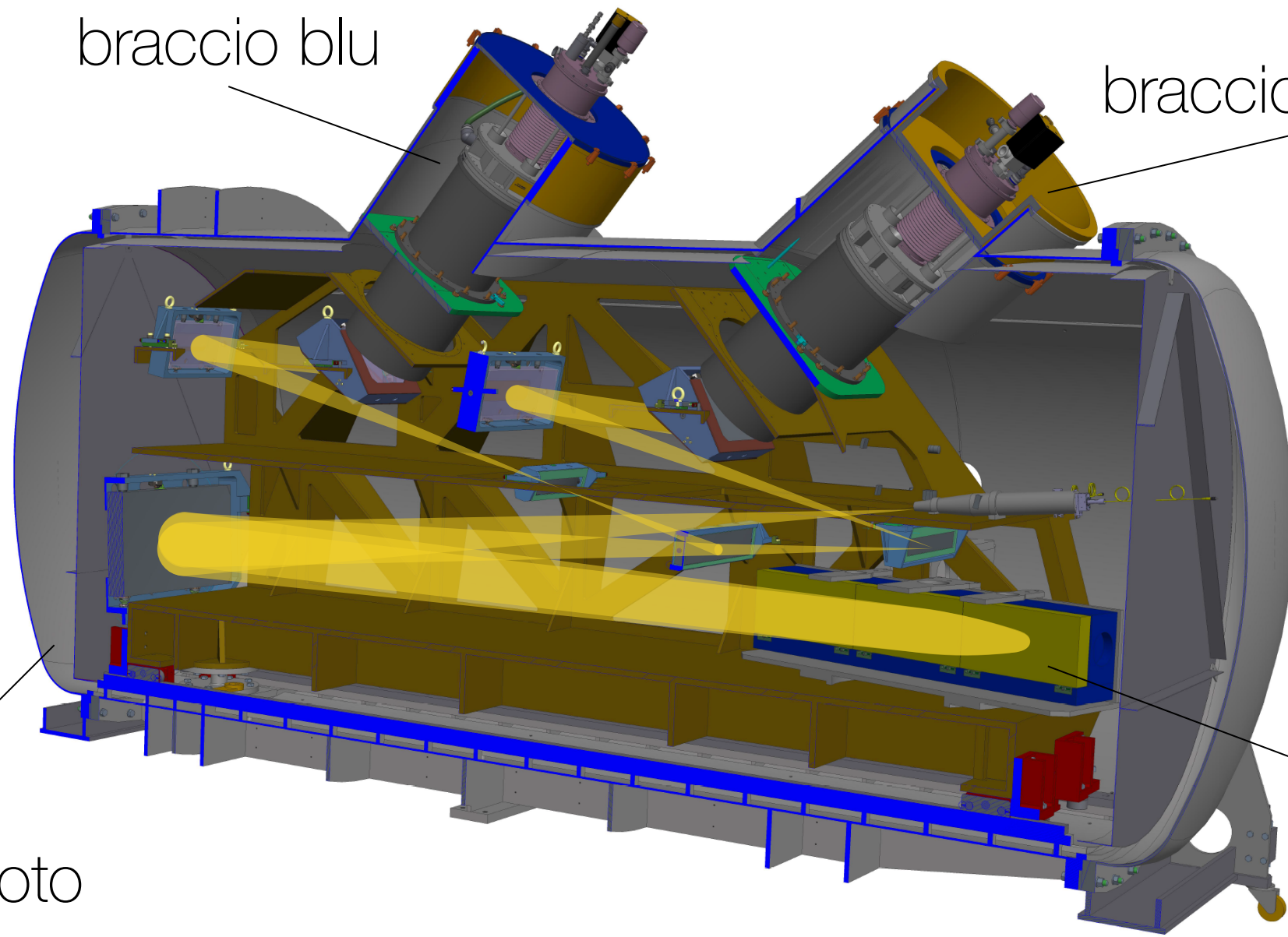




laboratorio coudé combinato

braccio blu

braccio rosso



camera a vuoto

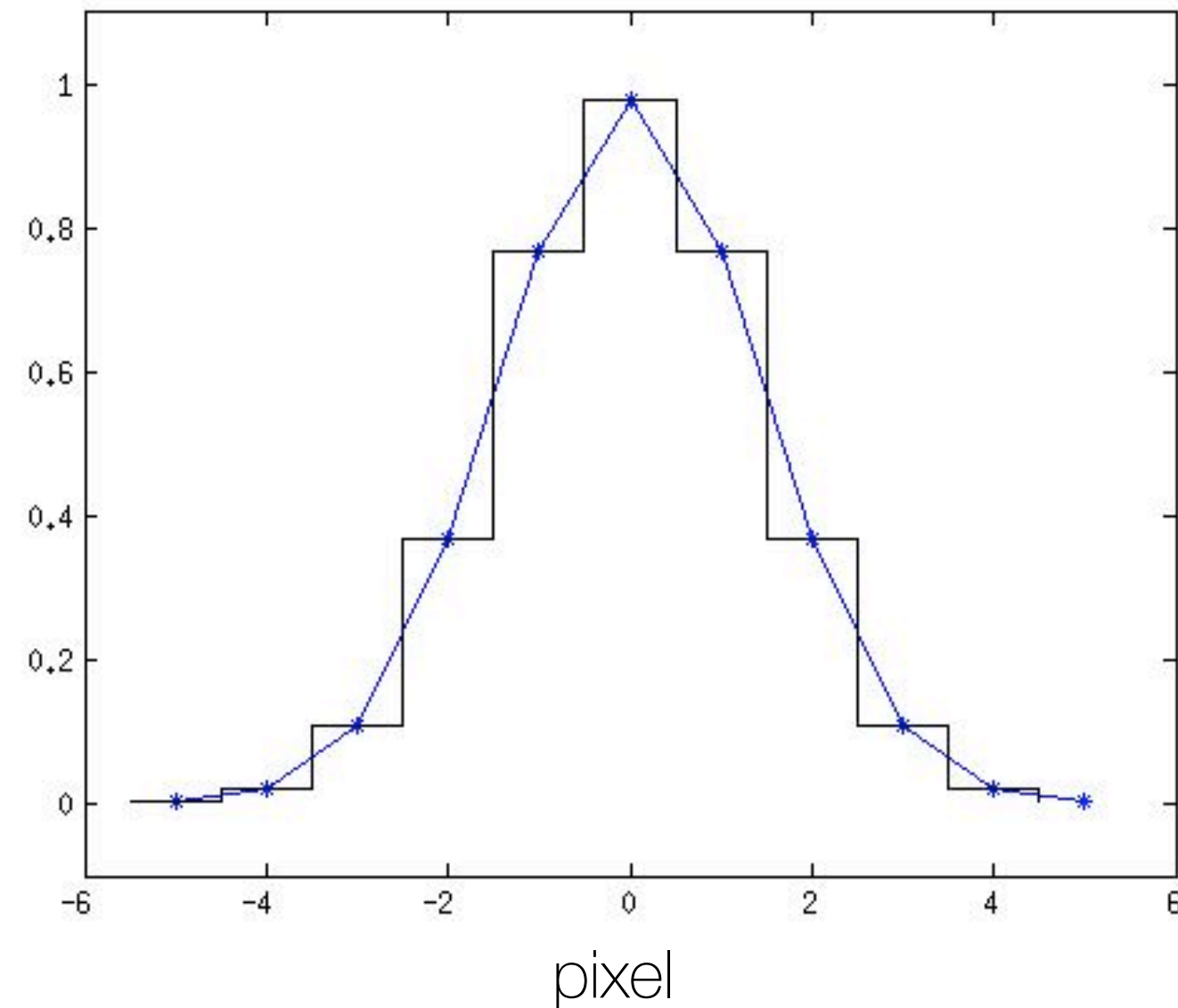
reticolo
echelle

LASER FREQUENCY COMB

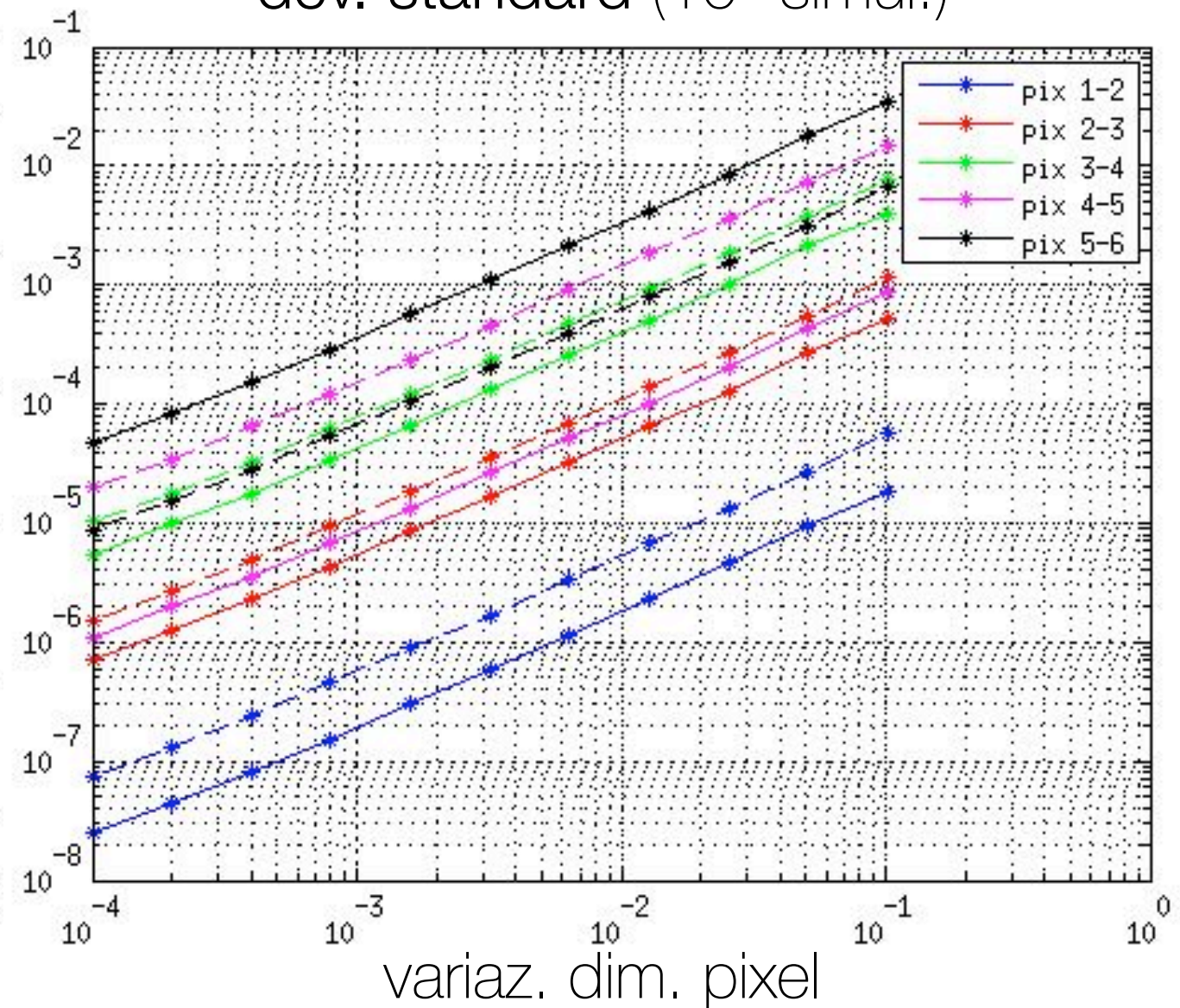
25 GHz

18 GHz

fit gaussiano riga LFC

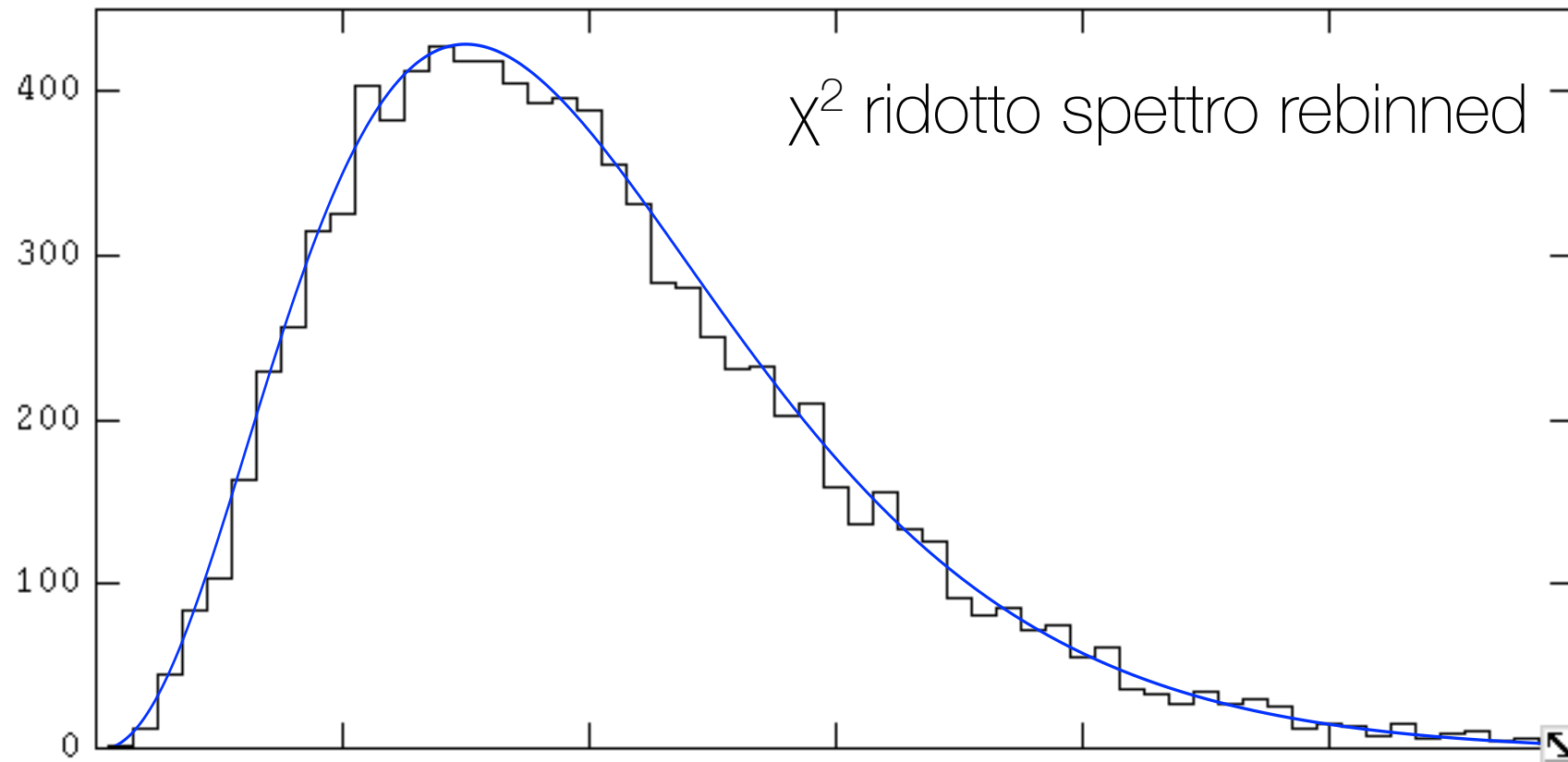


dev. standard (10^3 simul.)

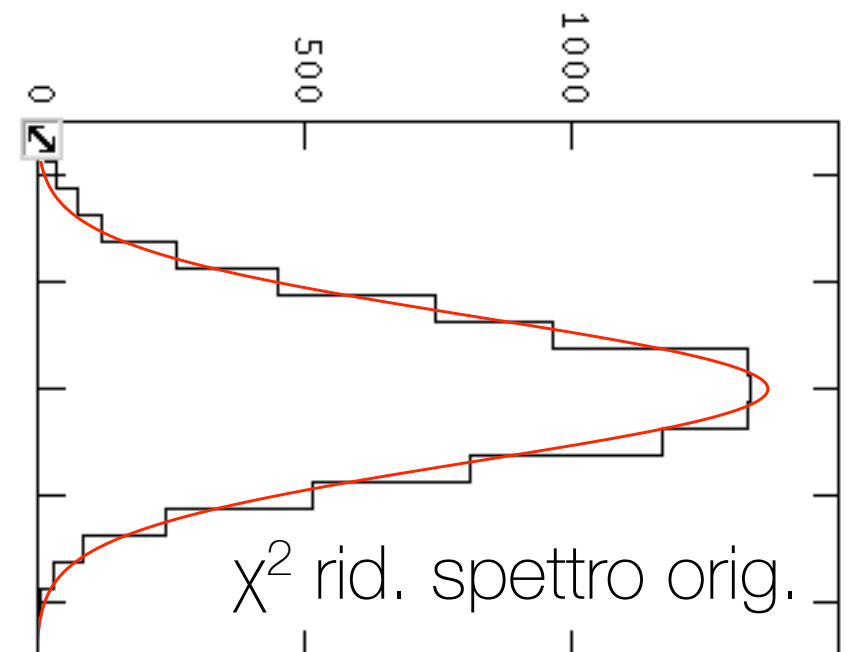
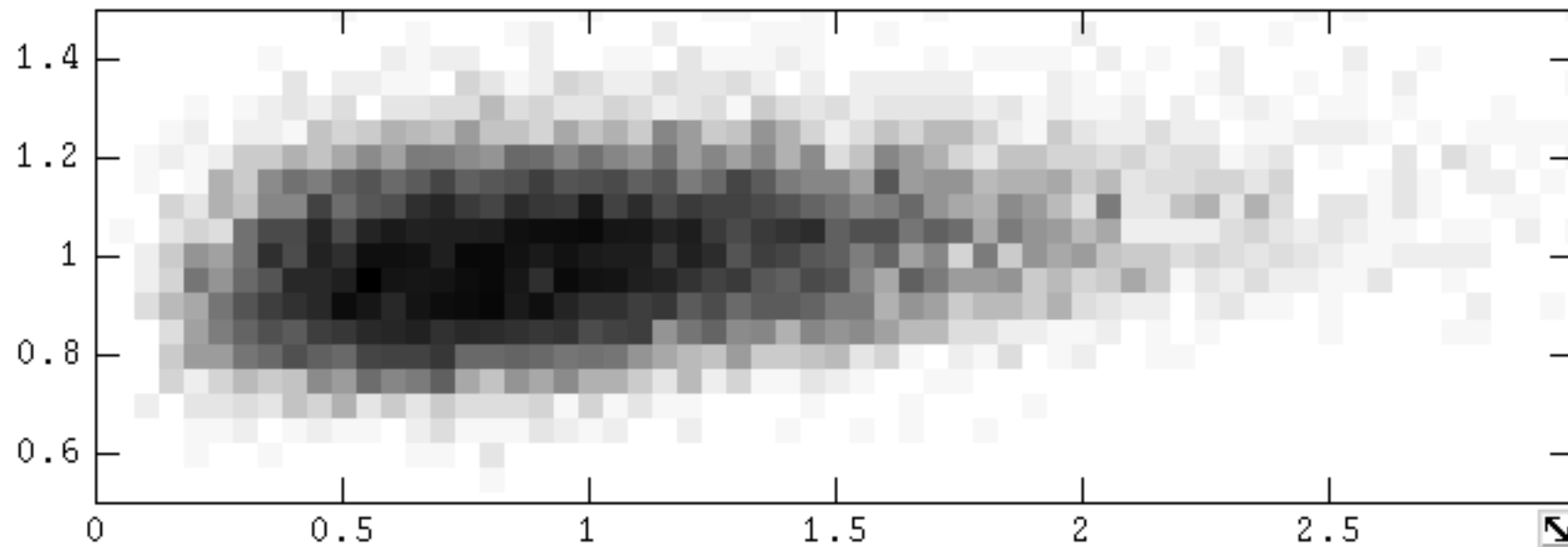


Lovis et al. 2014

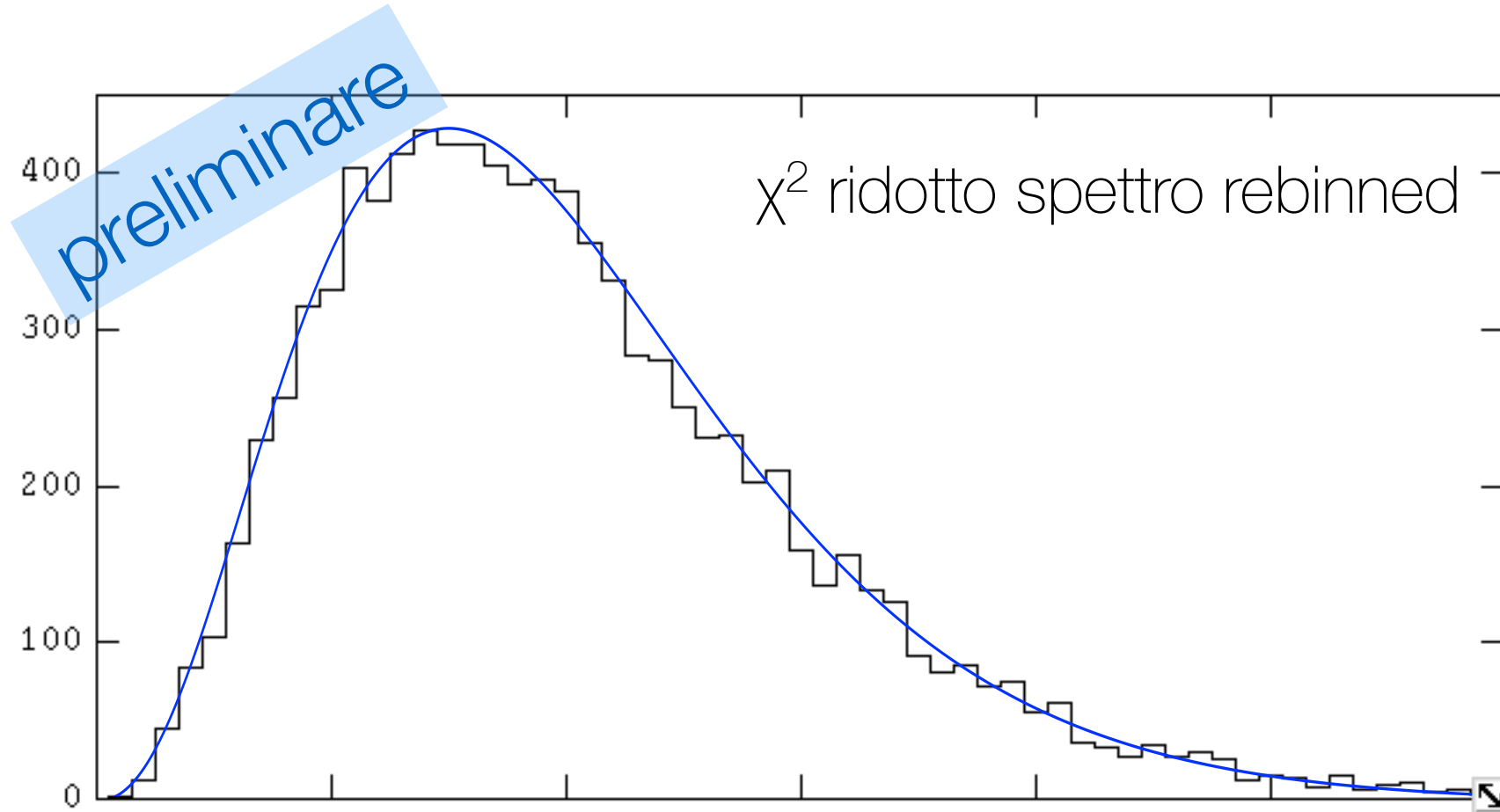
FIT DELLE RIGHE DI ASSORBIMENTO



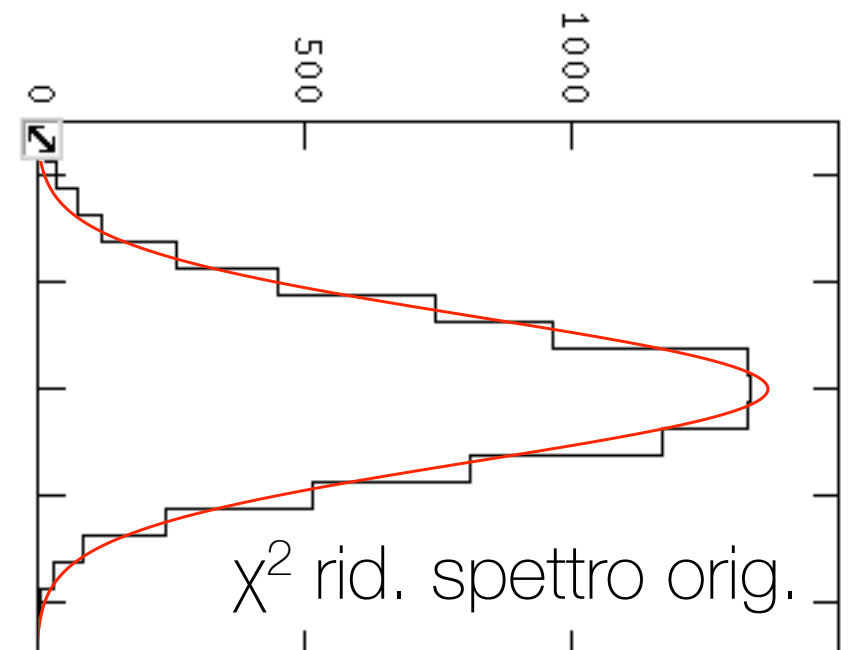
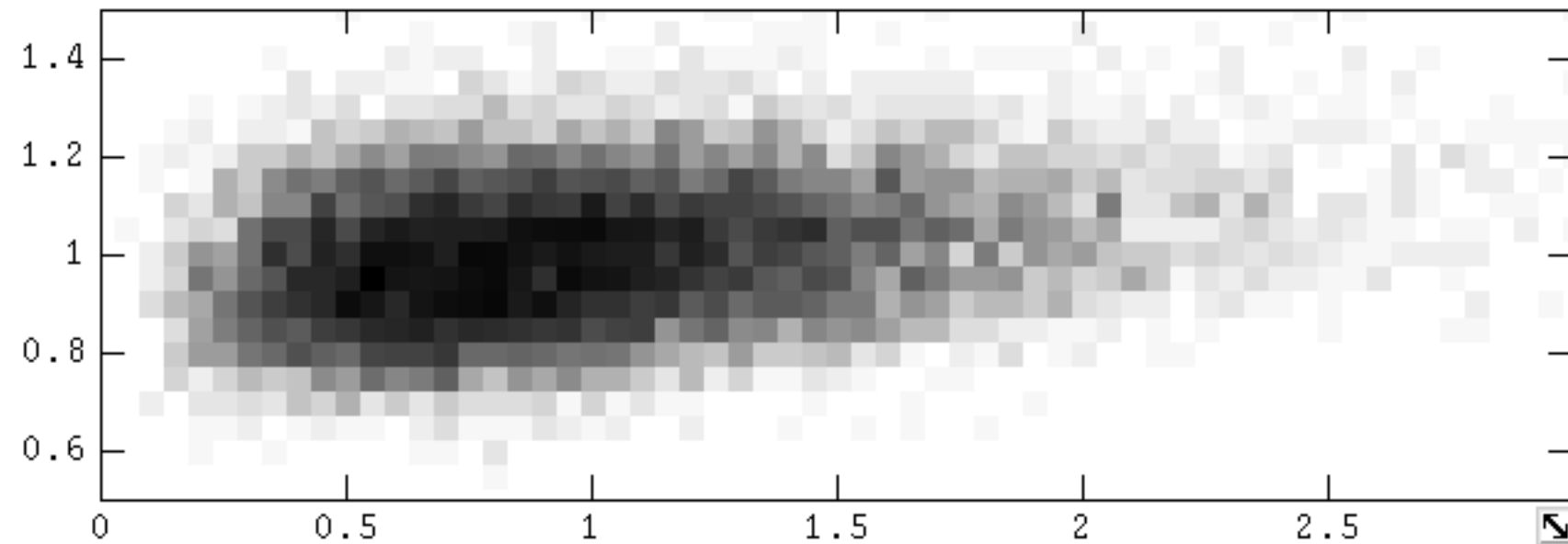
fit di Voigt su 1 riga
 $\log N = 13.51$
 $b = 20.0$
(10^4 simul.)



FIT DELLE RIGHE DI ASSORBIMENTO



fit di Voigt su 1 riga
 $\log N = 13.51$
 $b = 20.0$
(10^4 simul.)





Components Data Outline

Search Components

All Ontologies and Folders

- ▶ Components
- ▶ Projects
- ▶ Statistics
- ▶ Demos
- ▶ Actors
- ▶ Daturbine
- ▶ Directors
- ▶ Eso-reflex
- ▶ Job
- ▶ Opendap
- ▶ Outreach
- ▶ R

0 results found.

Workflow



ESPRESSO DAS Workflow (v. 0.5.0)

Interactive actors

DIRECTORIES

- Input directories:**
- ROOT_DATA_DIR: /Users/Guido/Work/data_wkf/
 - RAW_DATA_DIR: \$ROOT_DATA_DIR/reflex_input/espda
 - CALIB_DATA_DIR: /Users/Guido/Work/install/calib/espda-0.5.0/
- Working Directories:**
- BOOKKEEPING_DIR: \$ROOT_DATA_DIR/reflex_book_keeping/espda/
 - LOGS_DIR: \$ROOT_DATA_DIR/reflex_logs/espda/
 - TMP_PRODUCTS_DIR: \$ROOT_DATA_DIR/reflex_tmp_products/espda/
- Output directories:**
- END_PRODUCTS_DIR: \$ROOT_DATA_DIR/reflex_end_products/espda/

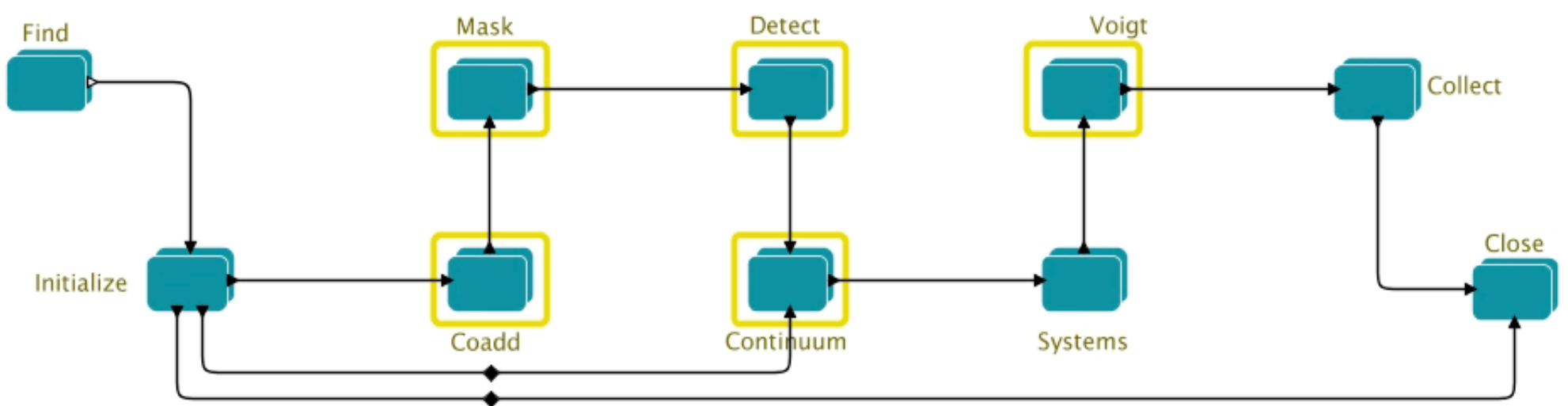
PARAMETERS

- General parameters:**
- RecipeFailureMode: Ask
 - EraseDirs: false
 - FITS_VIEWER: fv
- When a recipe fails: 'Continue', 'Stop', or 'Ask'
Erase working directories overruling Lazy Mode: 'true' or 'false'
Fits viewer used for inspection: 'fv'
- Interactivity parameters:**
- Mask: false
 - Coadd: true
 - Detect: true
 - Continuum: true
 - Voigt: true
 - Systems: false
- Display results and interact with recipes: 'true' or 'false'
- Recipe parameters:**
- Z_EM: 3.085
 - WAVEL_MIN: 485
 - WAVEL_MAX: 500
 - VEL_STEP: 1600
- Emission redshift of the QSO (3.085)
Minimum wavelength
Maximum wavelength
Wavelength step

PREPARATION

ANALYSIS

CONCLUSION



(Auxiliary parameters, do not change)

- GLOBAL_TIMESTAMP: 2015-06-01T13:42:46
- END_PRODUCTS_SUBDIR: he0940_2012-03-29T00:07:27_564l_err/2015-06-01T13:42:46
- ESORexArgs: --suppress-prefix=TRUE
- N_SELECTED_DATASETS: 1

ESPRESSO DAS Workflow (v. 0.5.0)

0 results found.

EXECUTION FINISHED: 79853 ms. Memory: 419328K Free: 189606K (45%)



Components Data Outline

Search Components

Advanced ... Sources Cancel

All Ontologies and Folders

- Components
- Projects
- Statistics
- Demos
- Actors
- Daturbine
- Directors
- Eso-reflex
- Job
- Opendap
- Outreach
- R

0 results found.

Workflow

DDF Director

ESPRESSO DAS Workflow (v. 0.5.0)

Interactive actors

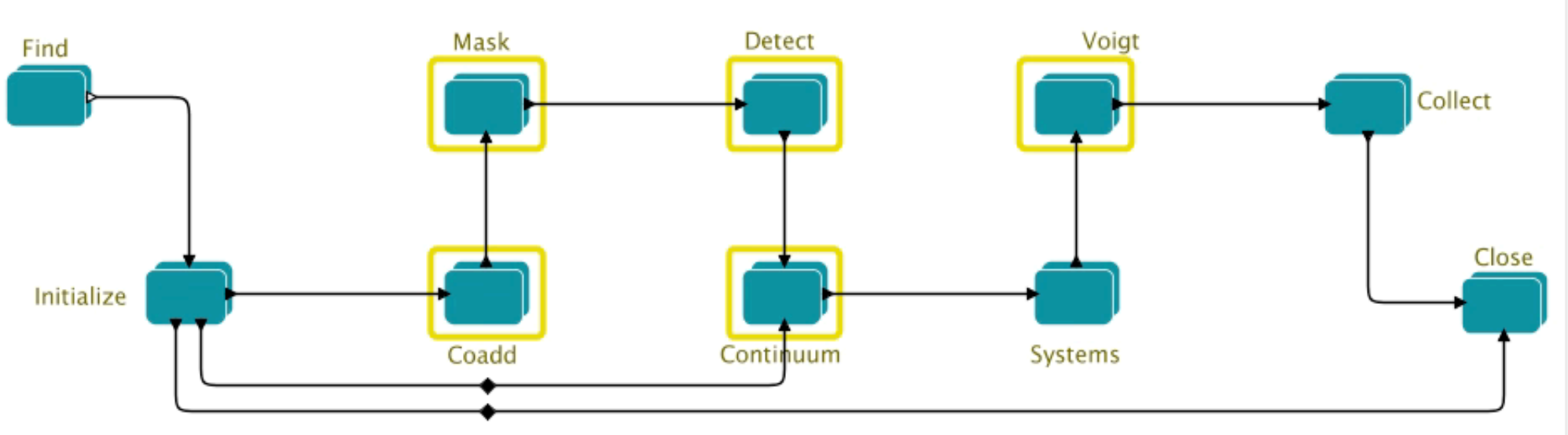
DIRECTORIES

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- ROOT_DATA_DIR: /Users/Guido/Work/data_wkf/
 - RAW_DATA_DIR: \$ROOT_DATA_DIR/reflex_input/espda
 - CALIB_DATA_DIR: /Users/Guido/Work/install/calib/espda-0.5.0/
- Working Directories:**
- BOOKKEEPING_DIR: \$ROOT_DATA_DIR/reflex_book_keeping/espda/
 - LOGS_DIR: \$ROOT_DATA_DIR/reflex_logs/espda/
 - TMP_PRODUCTS_DIR: \$ROOT_DATA_DIR/reflex_tmp_products/espda/
- Output directories:**
- END_PRODUCTS_DIR: \$ROOT_DATA_DIR/reflex_end_products/espda/

PARAMETERS

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PREPARATION ANALYSIS CONCLUSION



(Auxiliary parameters, do not change)

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ESPRESSO DAS Workflow (v. 0.5.0)

DIRECTORIES PARAMETERS

Input directories: ...

Working Directories: ...

Output directories: ...

General parameters: ...

Interactivity parameters: ...

Recipe parameters: ...

PREPARATION ANALYSIS CONCLUSION

Find Initialize Mask Coadd Detect Continuum Voigt Systems Collect Close