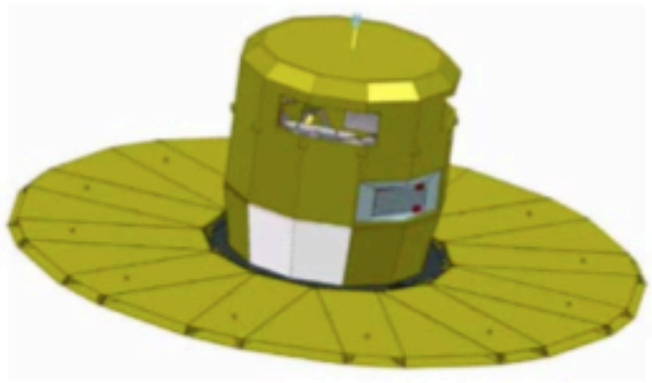
IL TRATTAMENTO DEI CAMPI CROWDED

CU5-DU11-Italian Team

G.Giuffrida[1], P.M. Marrese[1]
L. Pulone[2], M.Castellani[2], G. Iannicola[2]
R. Buonanno[1,3,4], A. Piersimoni[3], F. De Luise[3]

[1]INAF-ASDC [2]INAF-OAR [3]INAF-OACTe [4]Univ TOV

G. Giuffrida



CU2
Simulations
Barcelona

CU9
Catalogue
access

Ground station
ESOC

CU3
astrometric
processing
ESAC/Torino

CU8
astrophysical
parameters
CNES

Main database,
IT
ESAC

CU4
object
processing
CNES

CU7
variability
analysis
Geneva/ISDC

CU5
photometric
processing
Cambridge

CU6
spectroscopic
processing
CNES

Data processing and analysis consortium

Photometry Measurement Concept

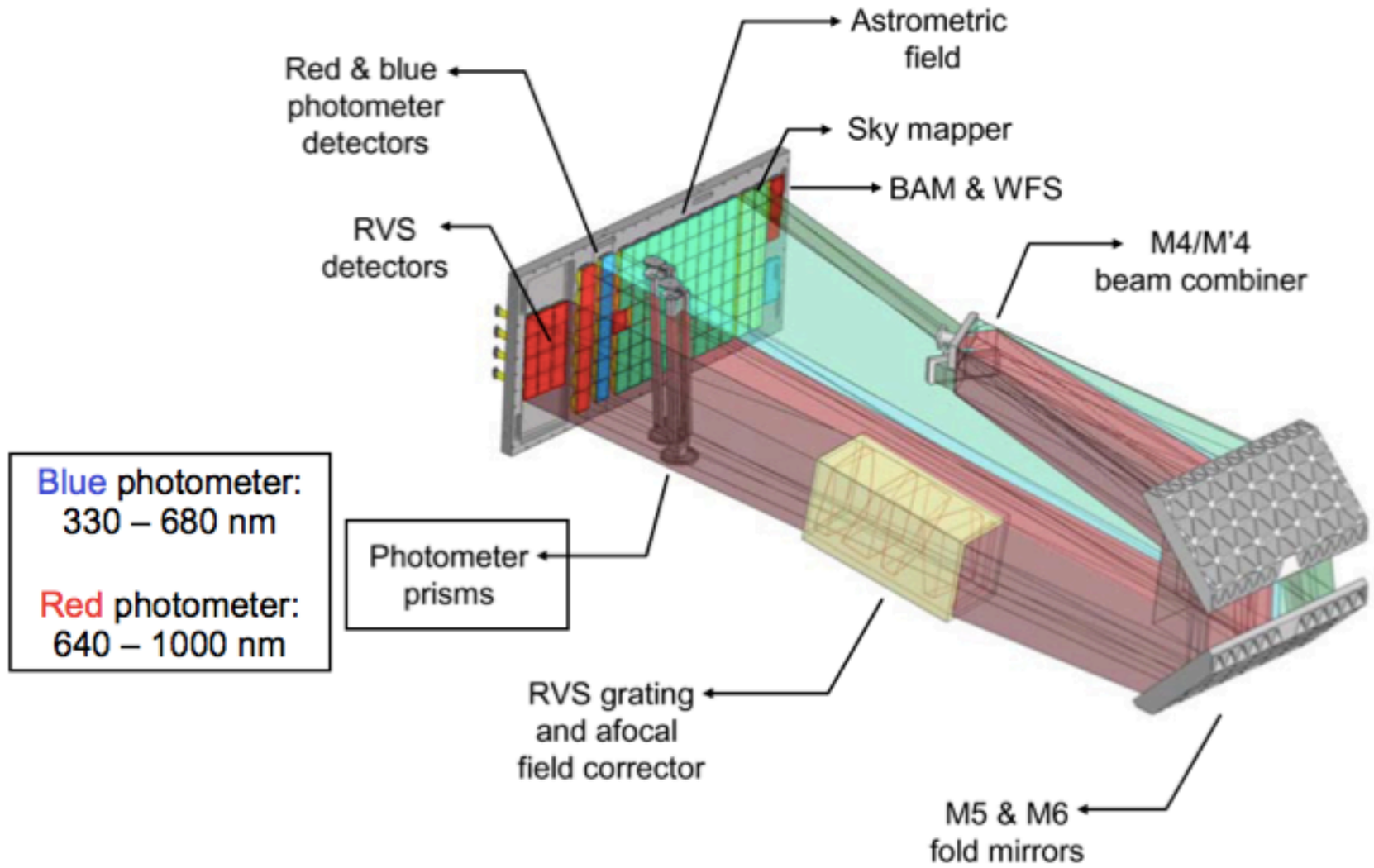
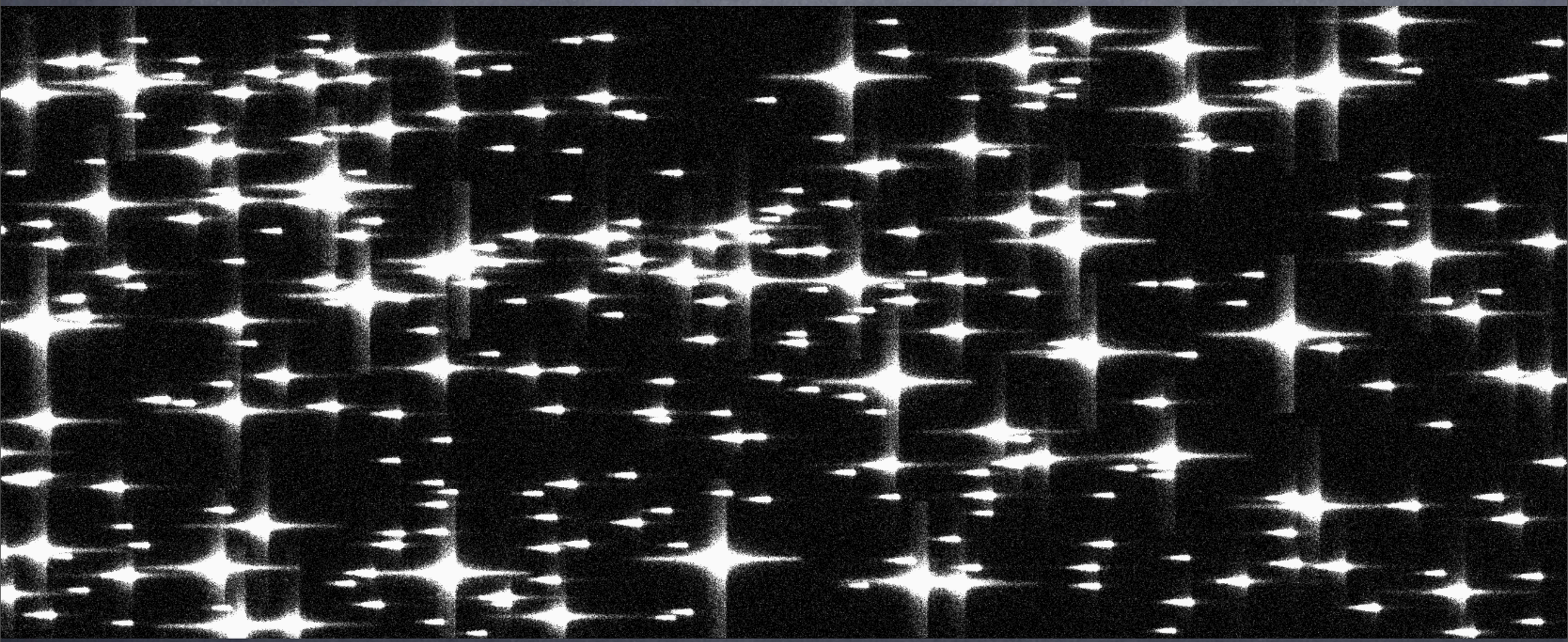
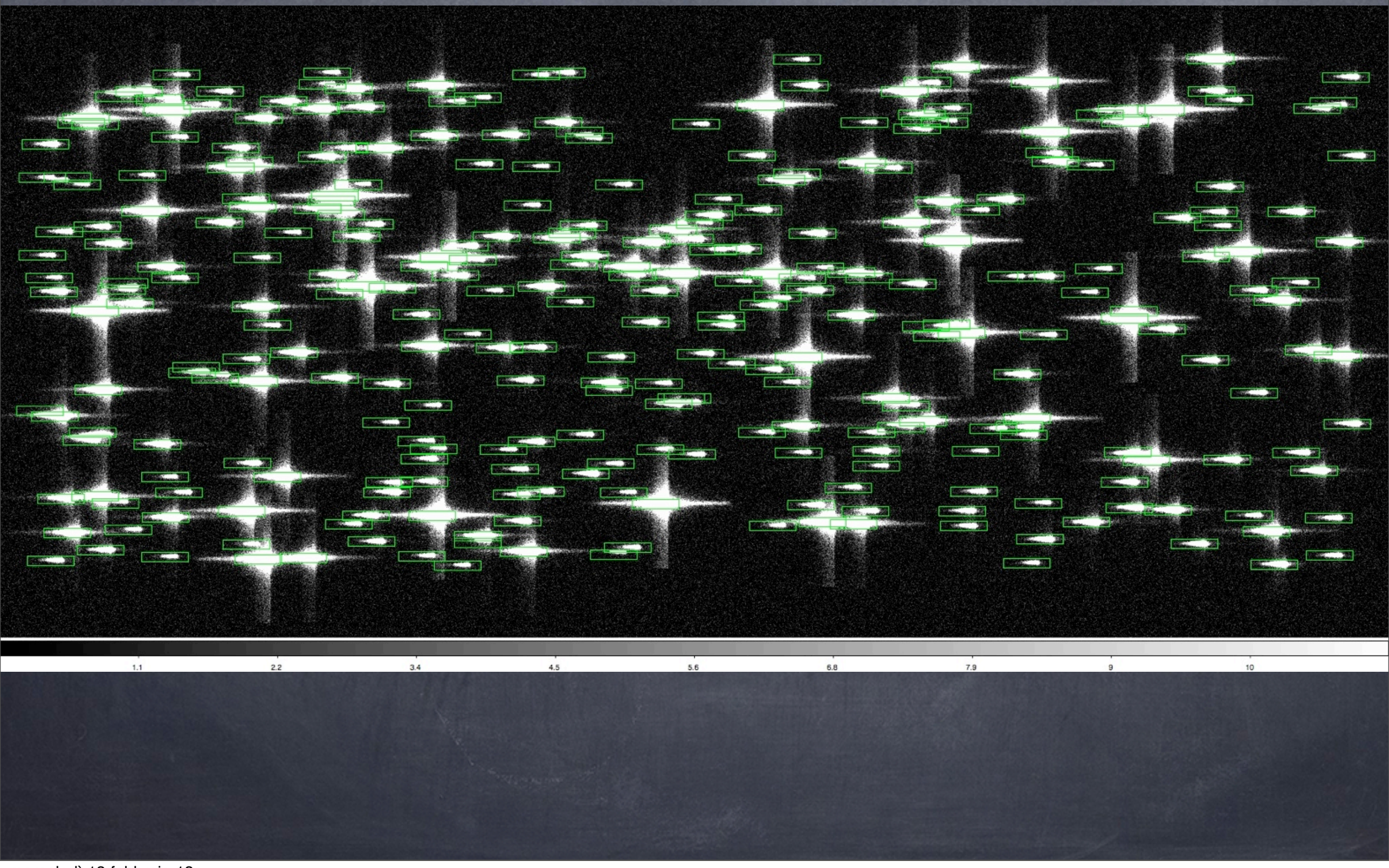
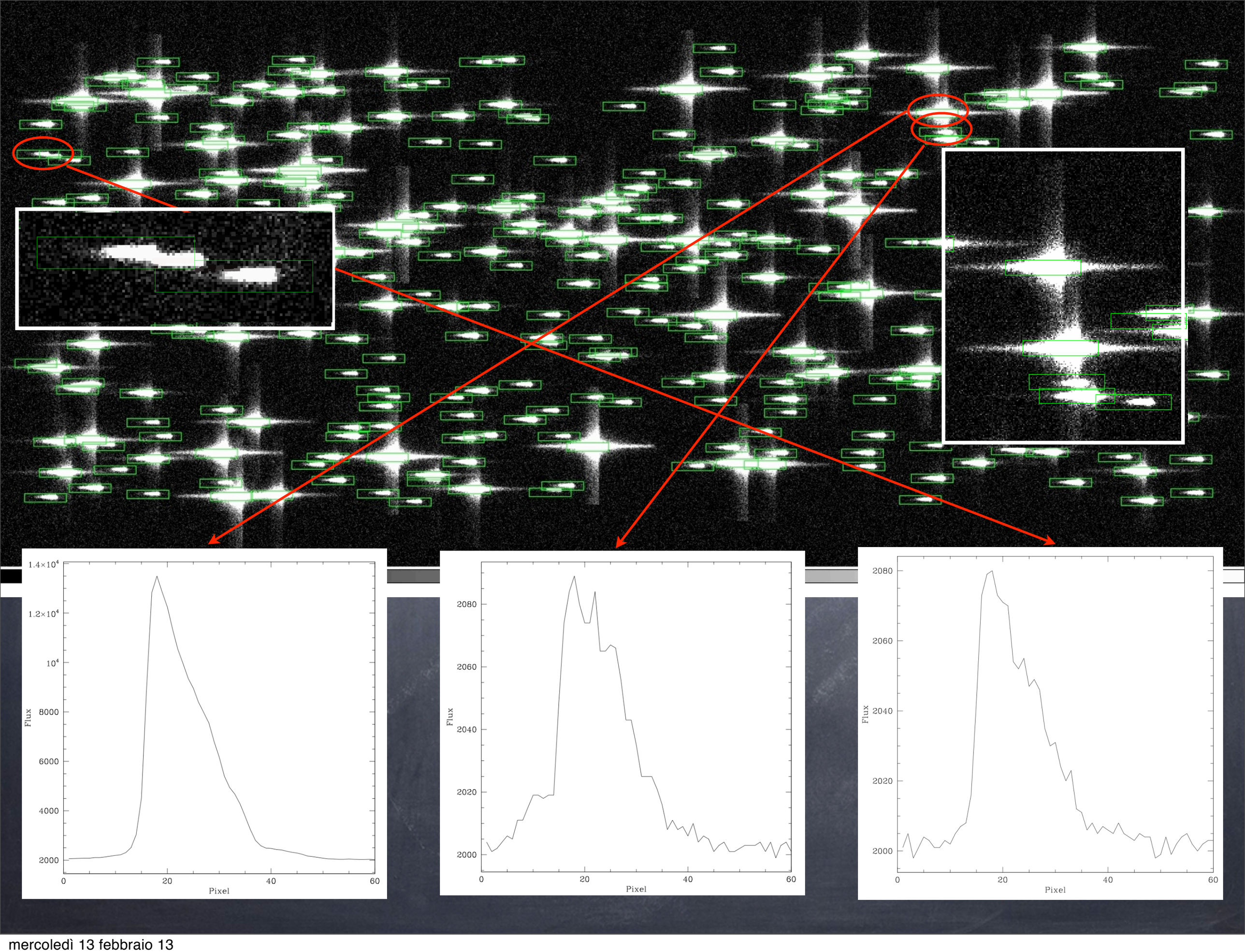


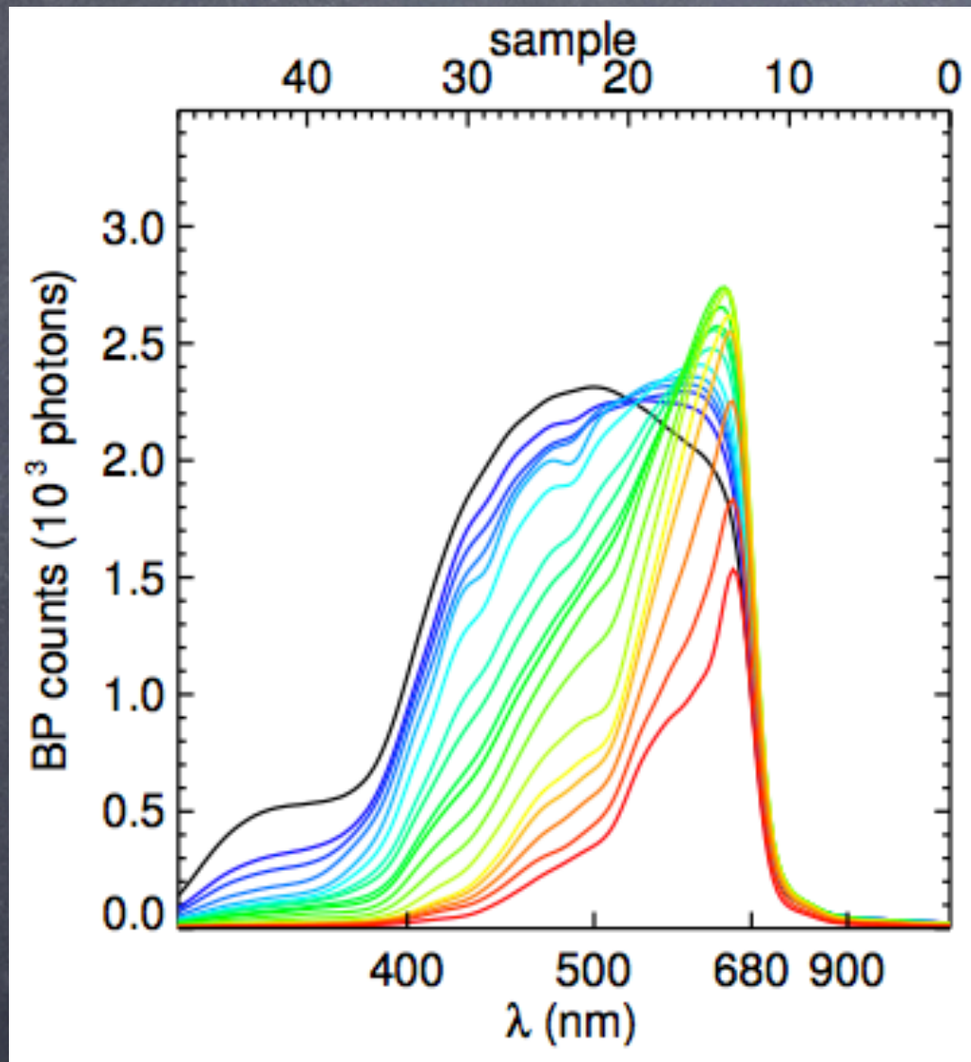
Figure courtesy EADS-Astrium

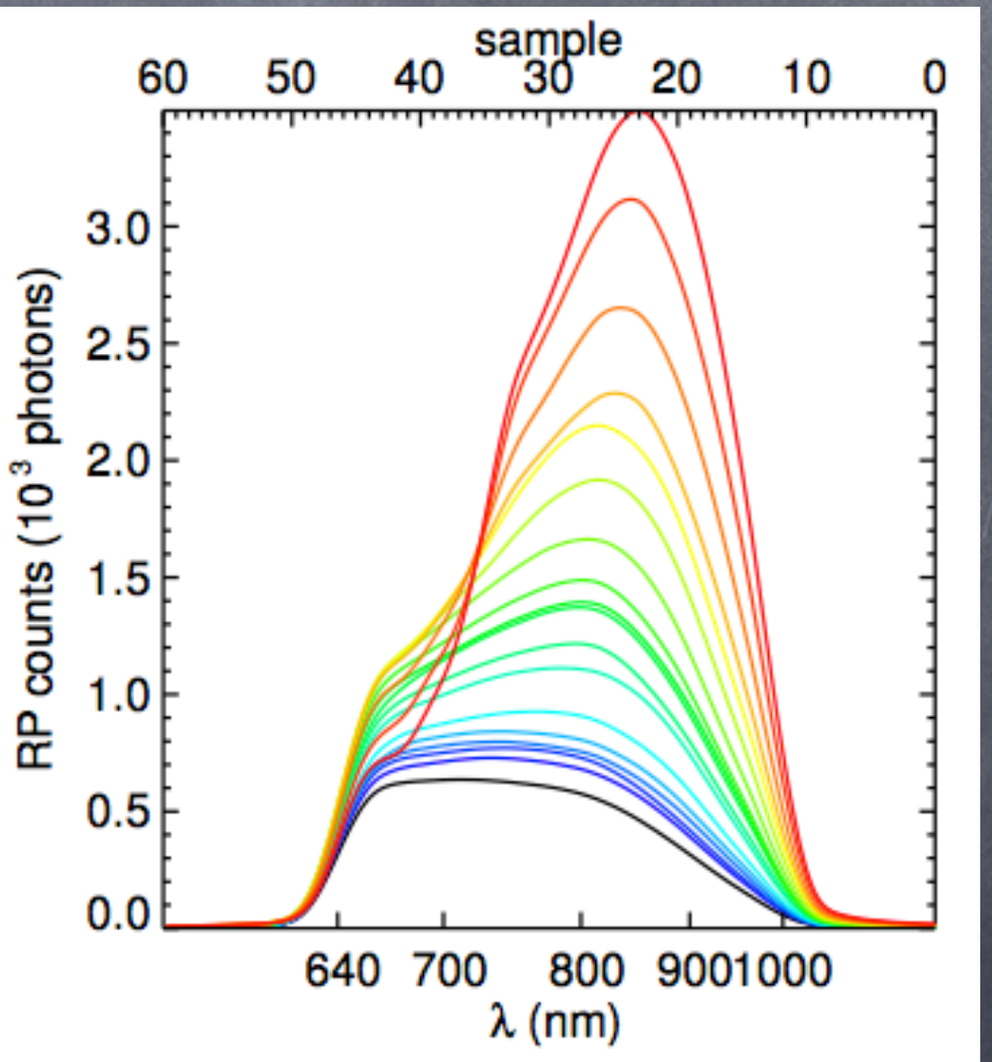
BP (300-660 nm) ~ 3–30 nm/pixel




1.1
2.2
3.4
4.5
5.6
6.8
7.9
9
10


1.4×10^4
1.2×10^4
10^4
8000
6000
4000
2000
Flux
0
20
40
60
Pixel
2080
2060
2040
2020
2000
Flux
0
20
40
60
Pixel
2080
2060
2040
2020
2000
Flux
0
20
40
60
Pixel


sample
40
30
20
10
0
3.0
2.5
2.0
1.5
1.0
0.5
0.0
BP counts (10^3 photons)
400
500
680
900
λ (nm)


sample
60
50
40
30
20
10
0
3.0
2.5
2.0
1.5
1.0
0.5
0.0
RP counts (10^3 photons)
640
700
800
900
1000
λ (nm)

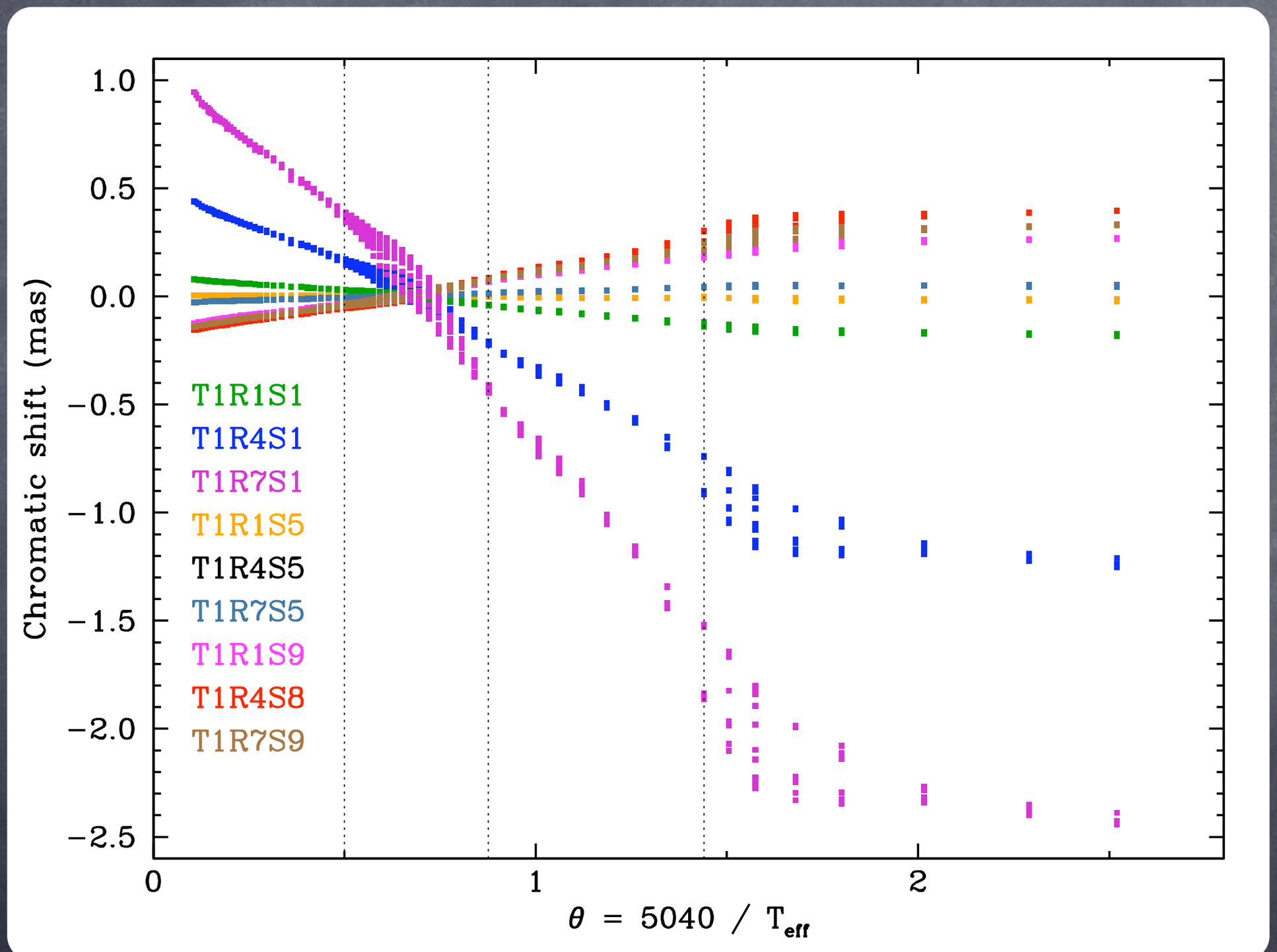
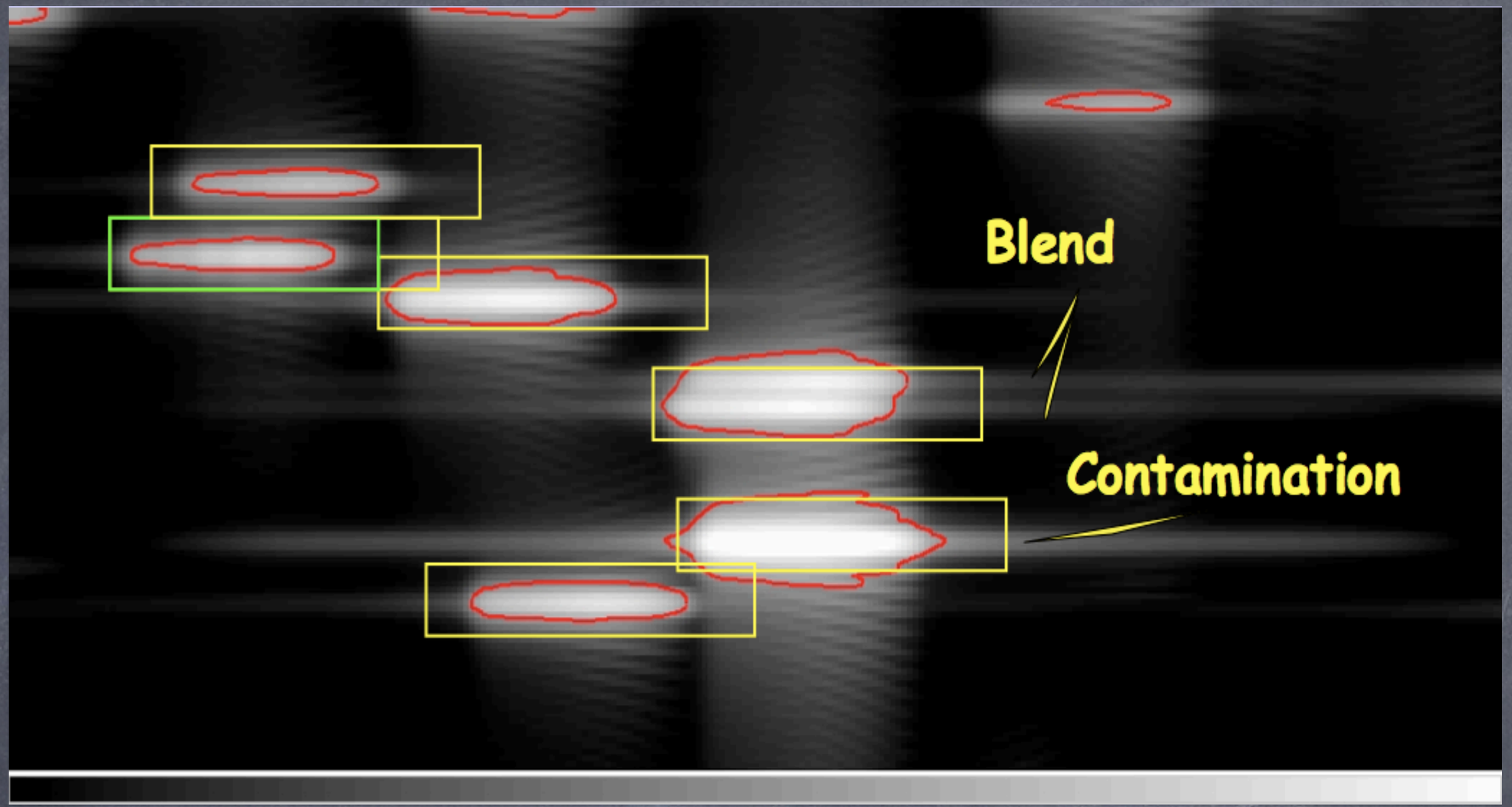
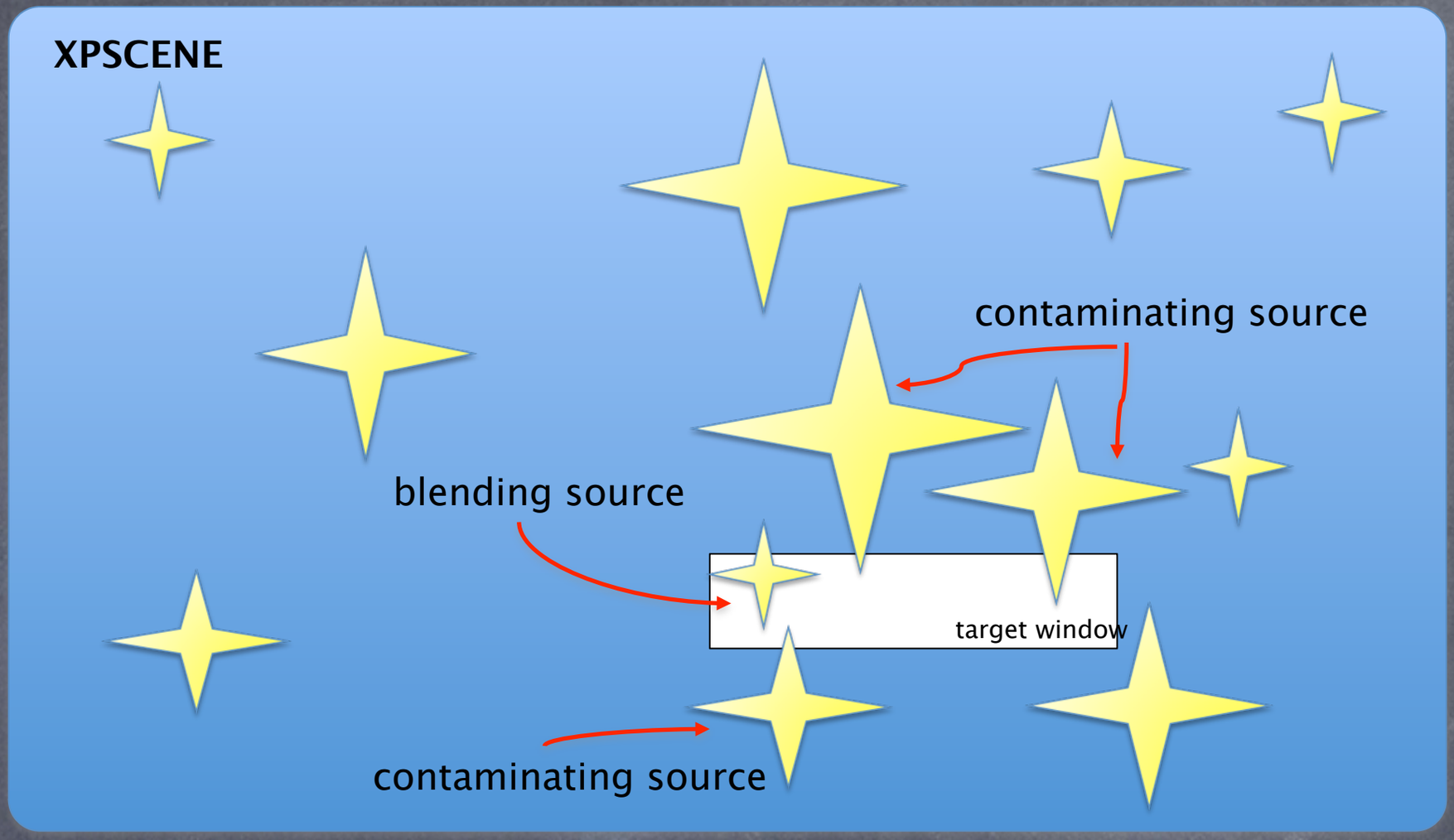


Figure courtesy GAIA-C5-TN-LEI-PM-004



- Crowding Evaluation
- Decontamination
- Deblending

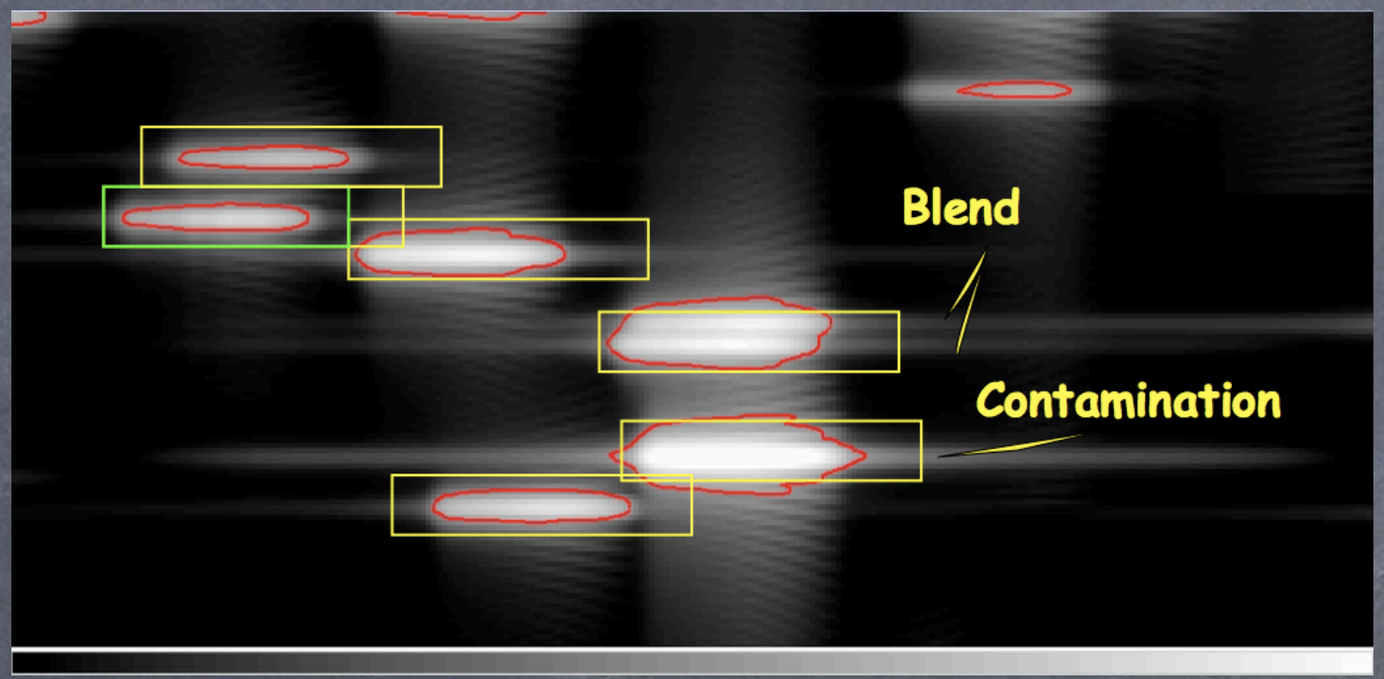
Crowding Evaluation



- Discriminate:
  - blended sources;
  - contaminated sources;
  - both;
- Identify samples (part of transmitted source window) usable for background

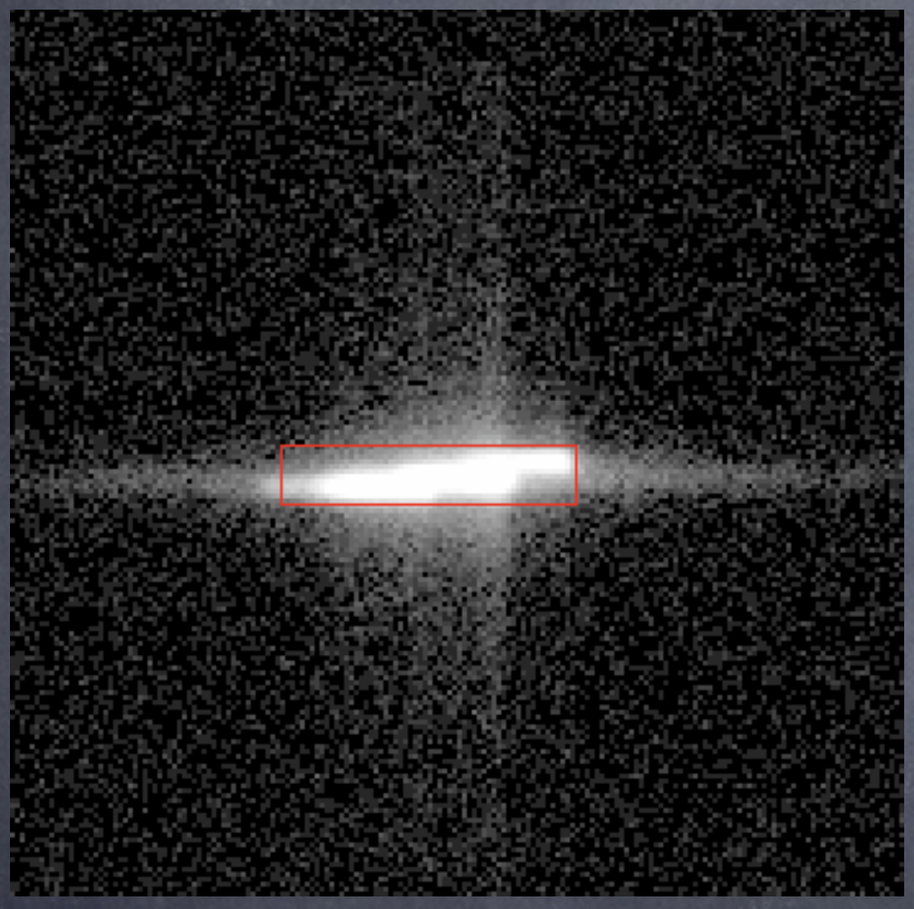
Decontamination & Deblending

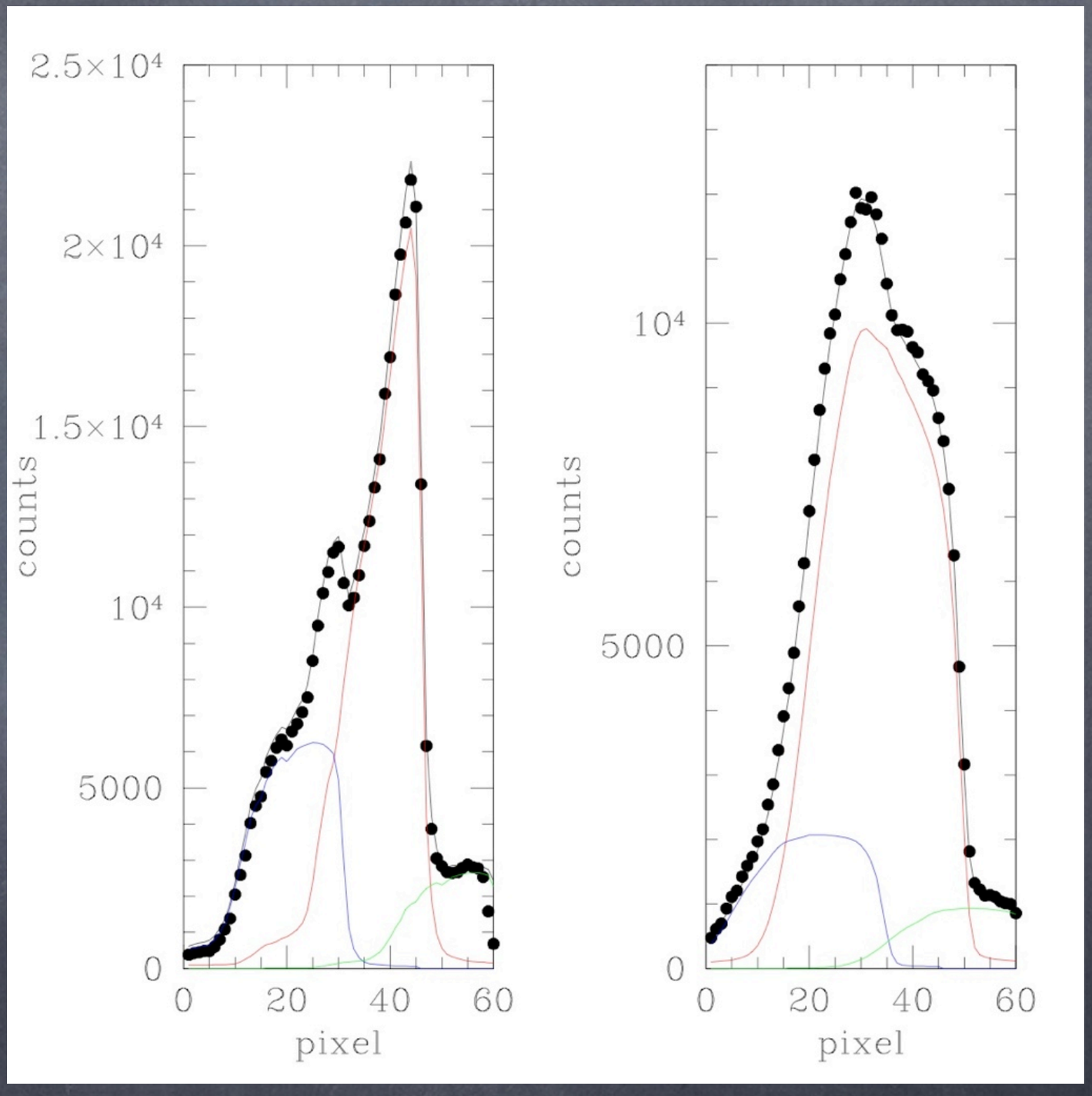
A system is defined as **contaminated** when two (or more) objects are located in **two different** windows, but their **fluxes influences each other** (fluxes overlapping)



A system is defined as **blended** when two (or more) objects are located in the same window

Deblending




2.5×10⁴
2×10⁴
1.5×10⁴
10⁴
5000
0
counts
0
20
40
60
pixel
10⁴
5000
0
counts
0
20
40
60
pixel

Deblending

Deblending 1 (Per transit)

- Single Transit
- Flux Extraction
- Fast
- 2 years

Deblending 2 (Per source)

- Multiple Transit
- Forward Modeling (CTI)
- Flexible-Accurate
- Last years

PCA

Principal Component Analysis

$$S(pix) = \sum_{i=1}^{N} b_i * B_i(pix)$$