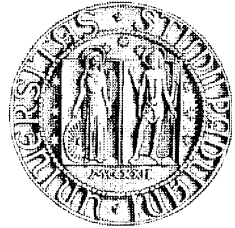


ISO Extragalactic Surveys

Data Reduction with the LARI Method



Mattia Vaccari

Dipartimento di Astronomia e CISAS “G. Colombo”, Università di Padova

vaccari@pd.astro.it

<http://mimir.pd.astro.it/~mattia>

Giulia Rodighiero	DipAstro, Padova	Carlo Lari	IRA-CNR, Bologna
Oliver Prouton	DipAstro, Padova	Francesca Pozzi	IRA-CNR, Bologna
Alessandra Gregnanin	DipAstro, Padova	Luca Angeretti	IRA-CNR, Bologna
Alberto Franceschini	DipAstro, Padova	Dario Fadda	IAC, La Laguna
Carlotta Gruppioni	OssAstro, Padova		

Origine ed Evoluzione delle Galassie

Dipartimento di Astronomia, Padova, 6-7 Febbraio 2002

ISO Data



Observing strategy:

- Raster sky scanning
- Low redundancy

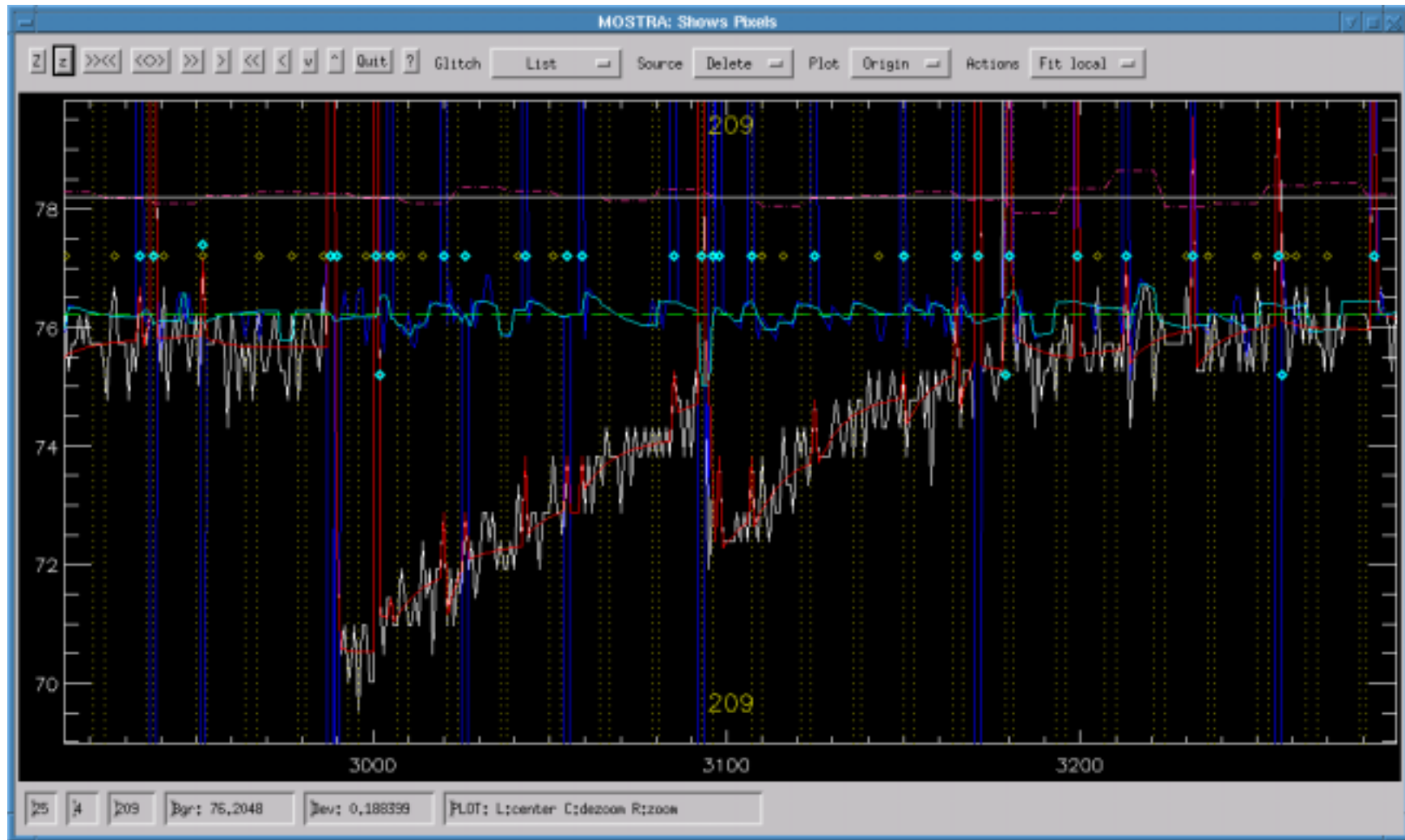
Detectors:

- Transient behaviour
- Cosmic ray hits



Source detection is tricky!

The LARI Method



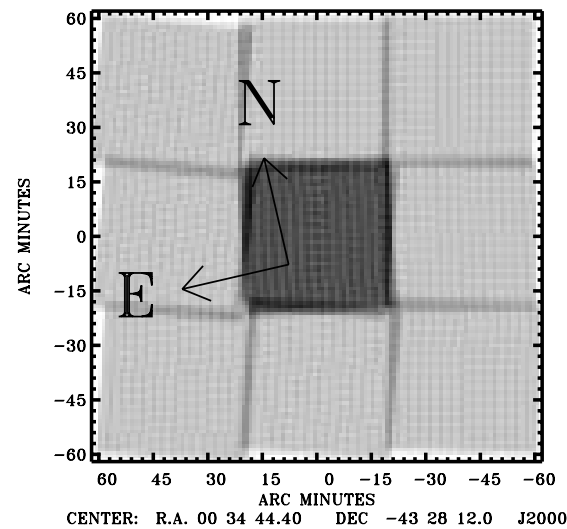
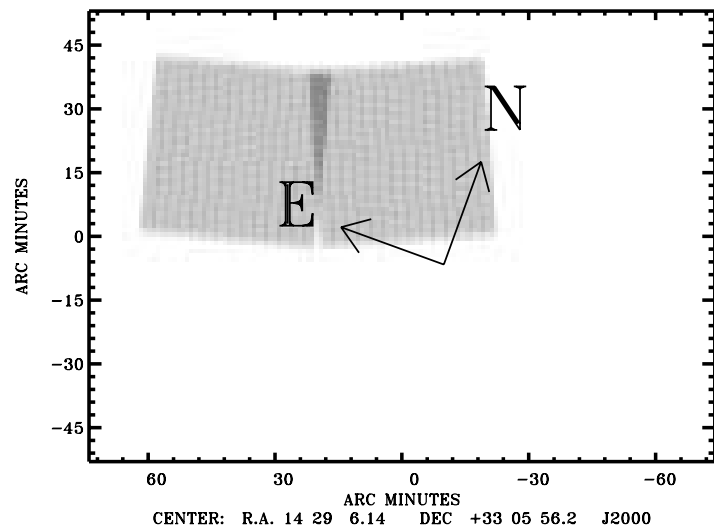
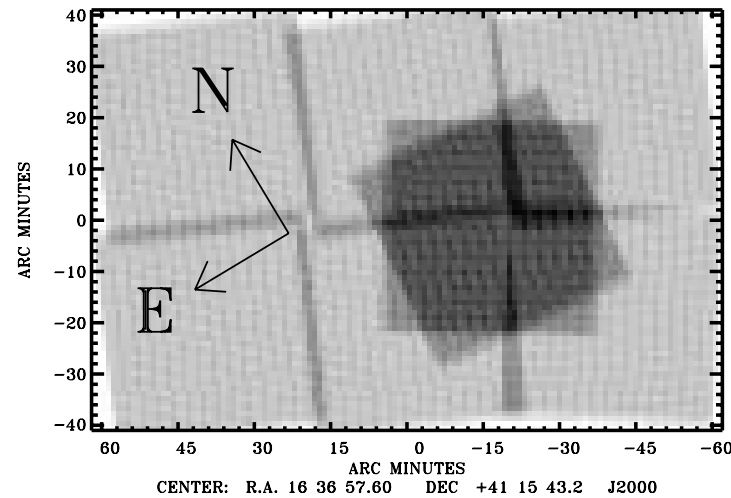
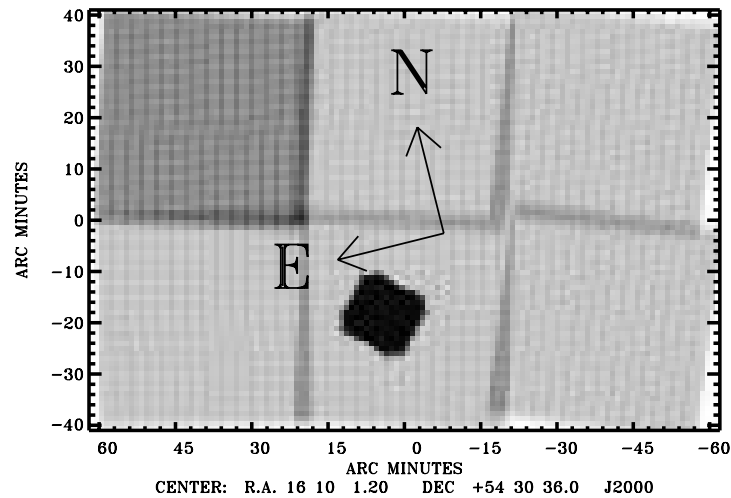
- Cosmic ray hits identification and background determination
- Cosmic ray hits and transient behaviour modelling
- Source detection and simulation of detected source fluxes

ISO Extragalactic Surveys

Name	λ (μm)	Integration (s)	Area (deg^2)
PHT Serendipity Survey	175	0.5	7000
CAM Parallel Mode	6.7	150	33
<i>ELAIS</i>	6.7, 15, 90, 175	40, 40, 24, 128	6, 11, 12, 1
CAM Shallow	15	180	1.3
FIRBACK	175	256, 128	1, 3
IR Back	90, 135, 180	23, 27, 27	1, 1, 1
SA 57	60, 90	150, 50	0.42, 0.42
CAM Deep	6.7, 15, 90	800, 990, 144	0.28, 0.28, 0.28
Comet fields	12	302	0.11
CFRS	6.7, 15, 60, 90	720, 1000, 3000, 3000	0.067, 0.067, 0.067, 0.067
CAM Ultra-Deep	6.7	3520	0.013
<i>ISOHDF South</i>	6.7, 15	> 6400 , > 6400	$4.7 \cdot 10^{-3}$, $4.7 \cdot 10^{-3}$
Deep SSA13	6.7	34000	$2.5 \cdot 10^{-3}$
<i>Deep Lockman</i>	6.7, 90, 175	44640, 48, 128	$2.5 \cdot 10^{-3}$, 1.2, 1
<i>ISOHDF North</i>	6.7, 15	12800, 6400	$1.4 \cdot 10^{-3}$, $4.2 \cdot 10^{-3}$

Different surveys are complementary in exploring the Depth-Area plane

ELAIS CAM 15 μm Dataset



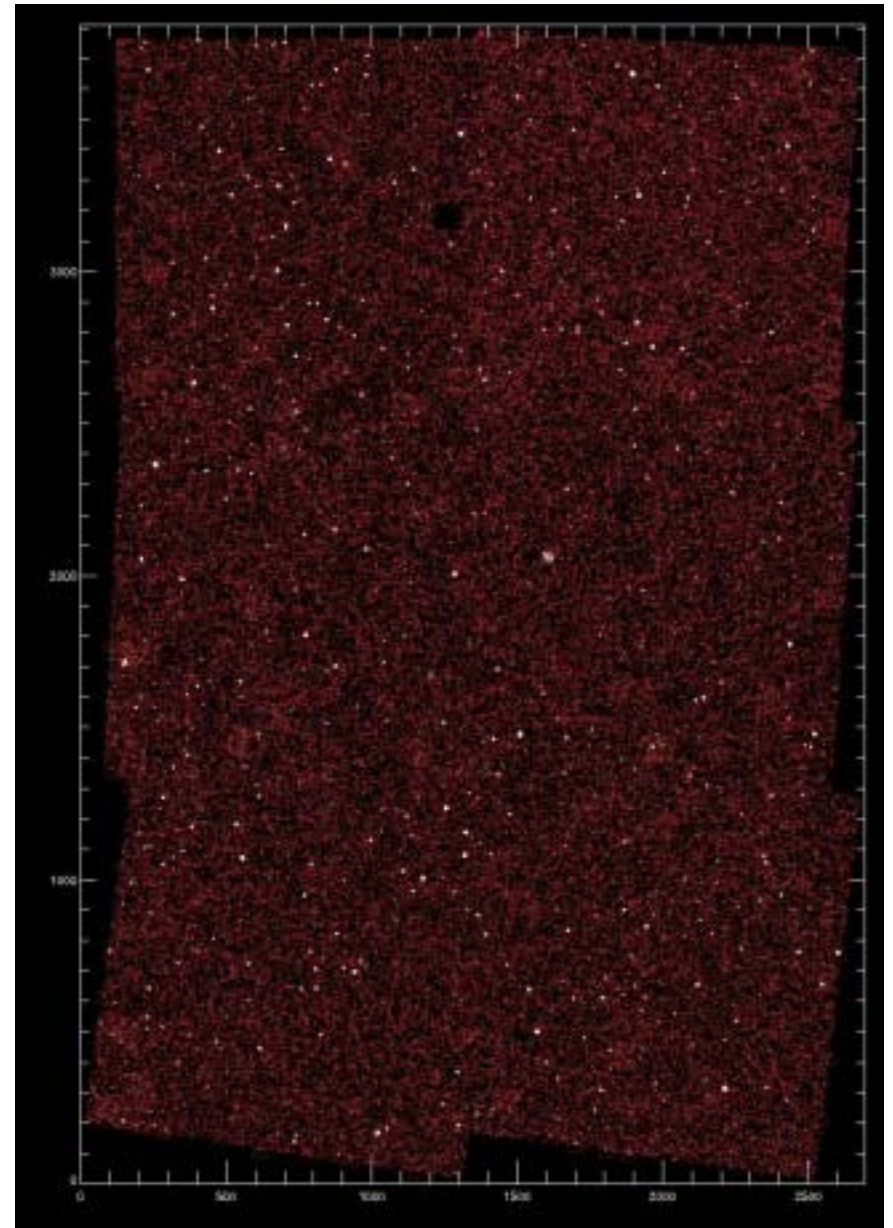
S1	4.9 deg ²
S2	0.15 deg ²
N1	3.25 deg ²
N2	3.25 deg ²
N3	1.1 deg ²
Total	13 deg ²

X ... Radio wavelength coverage

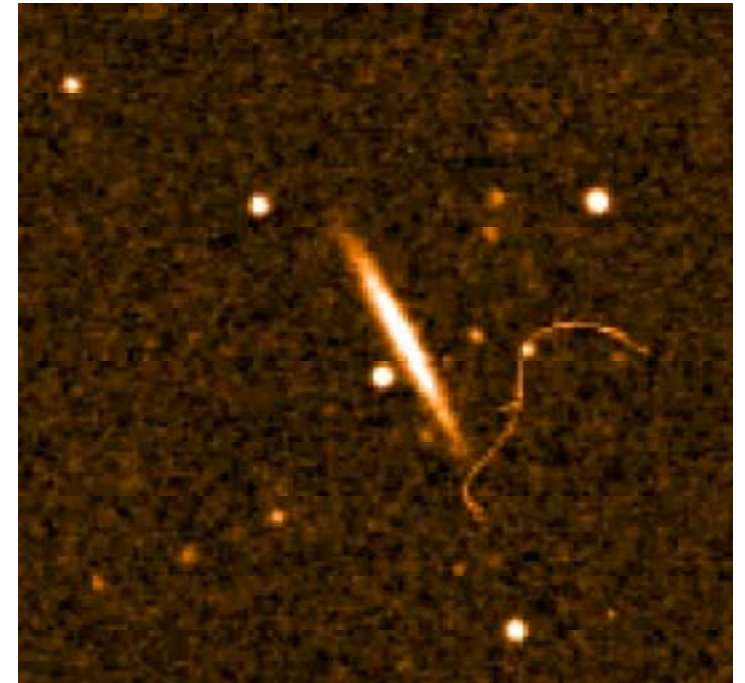
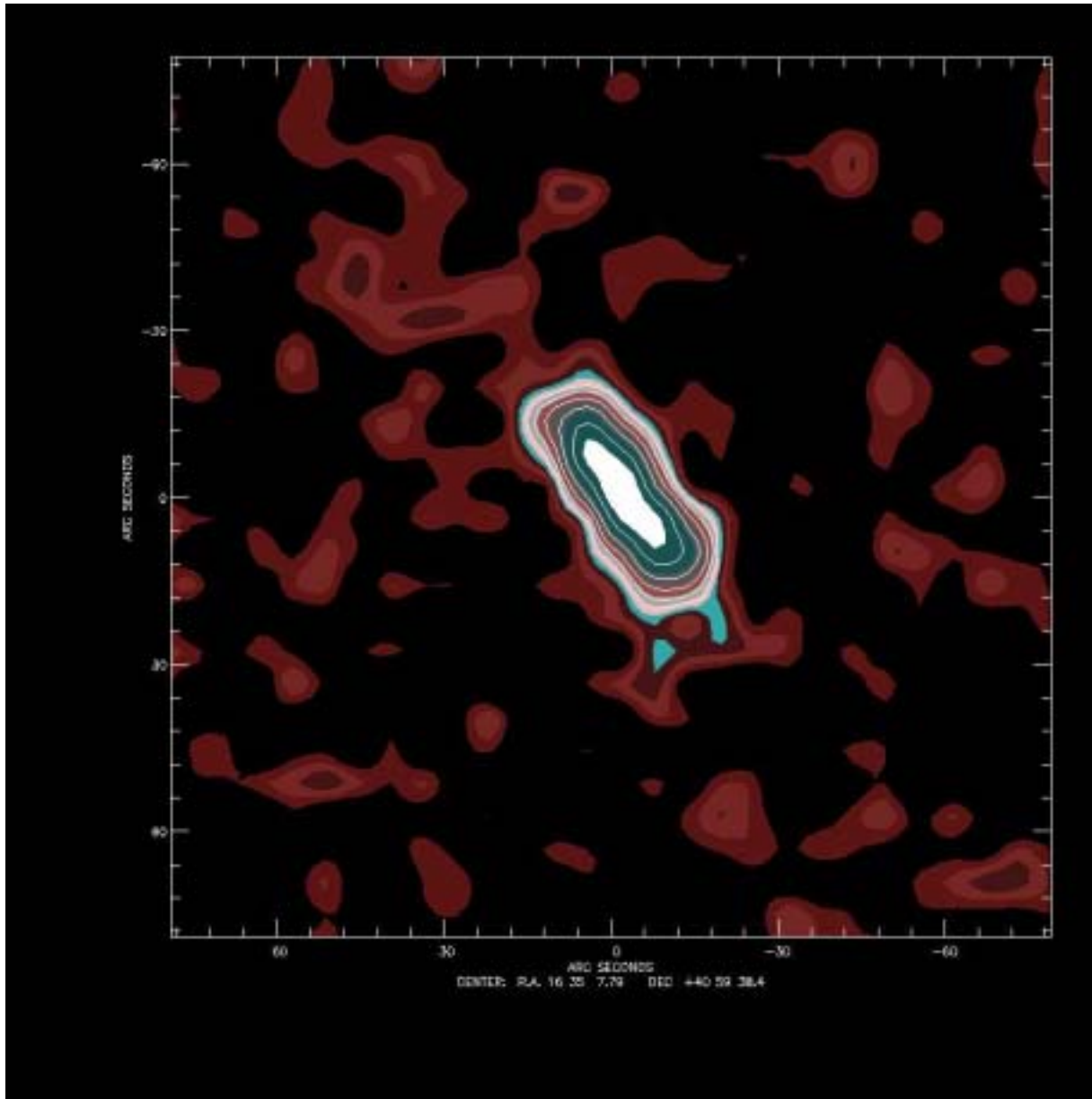
Mosaiced Maps

- 5- σ detections down to $\simeq 0.6$ mJy
- $\simeq 100$ sources/deg²
- 85 % completeness at 2 mJy

	S1	N1	N2	Total
PA	189	129	141	459
FA	462	399	439	1300



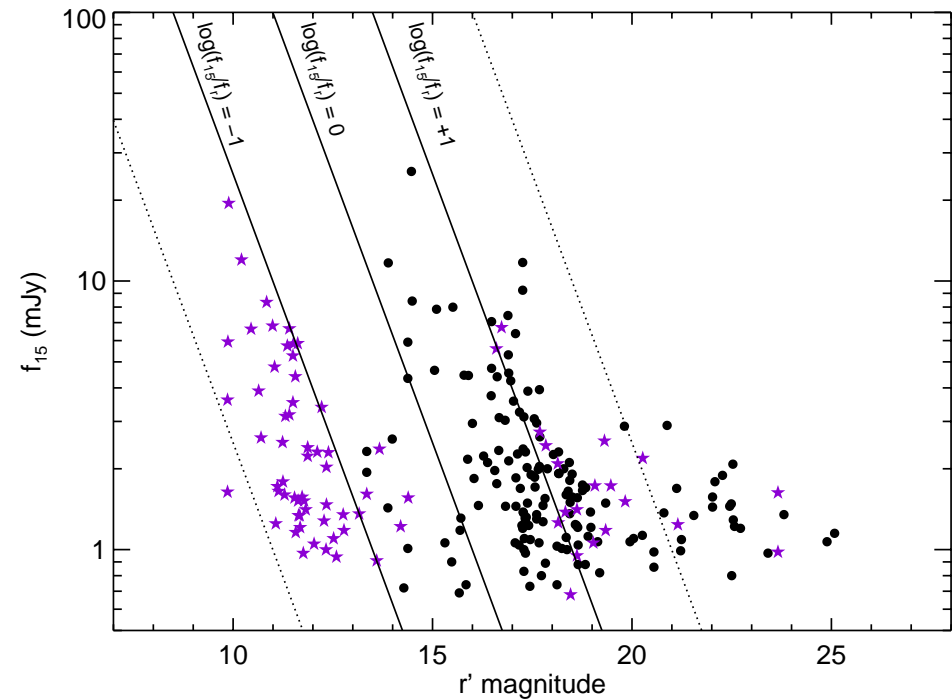
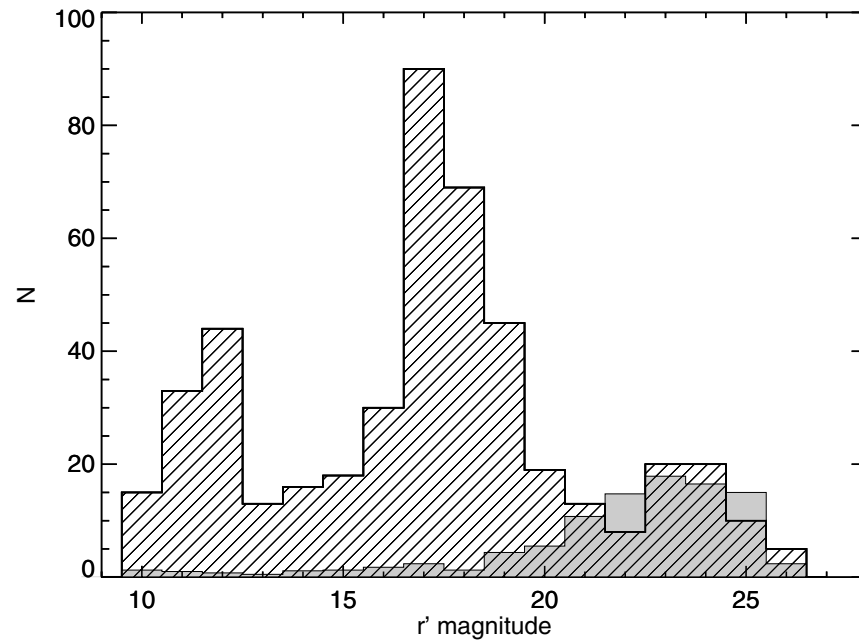
Individual Sources



UGC 10459

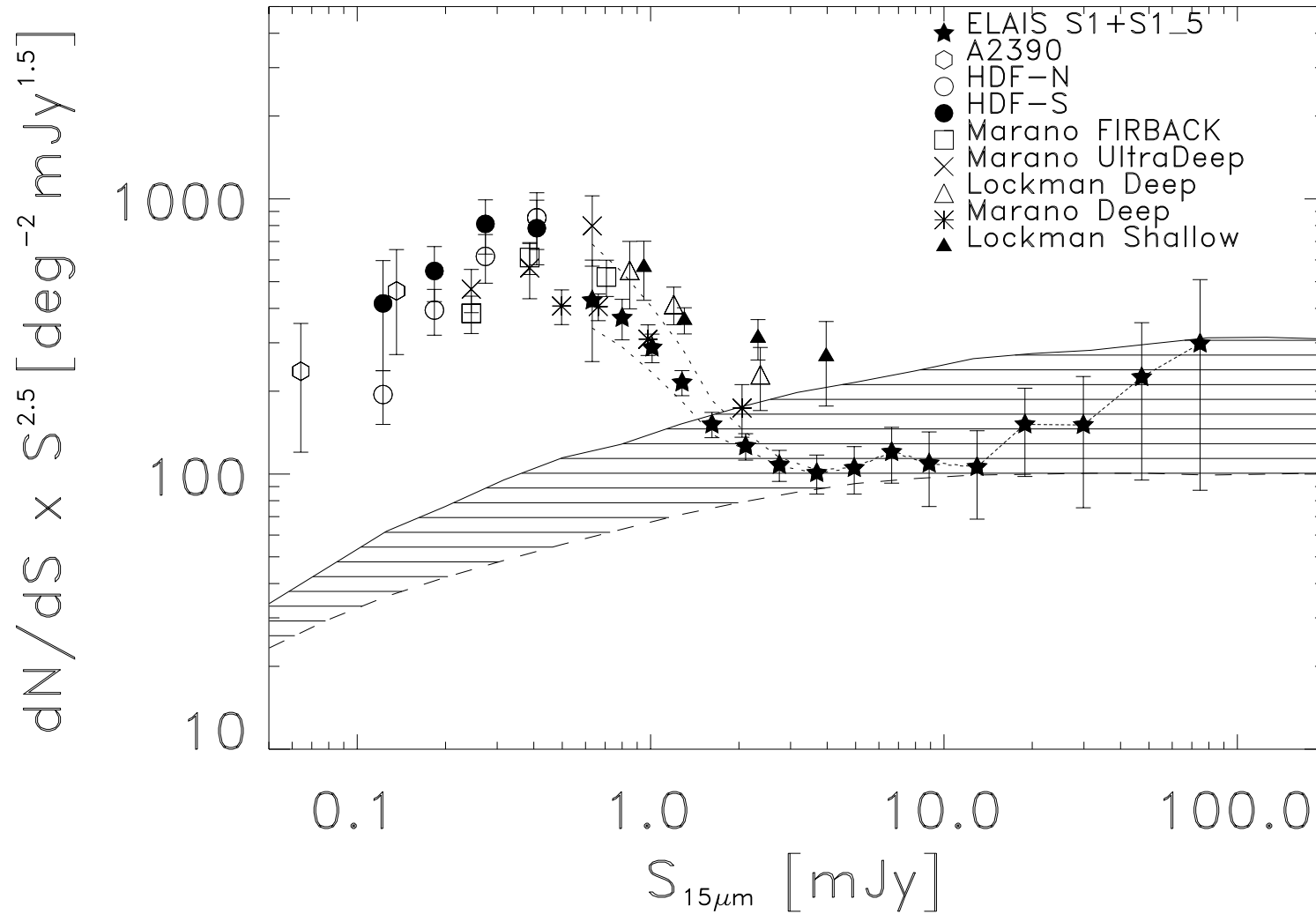
⇐ ELAISC15_J163525+405542

Optical Identifications



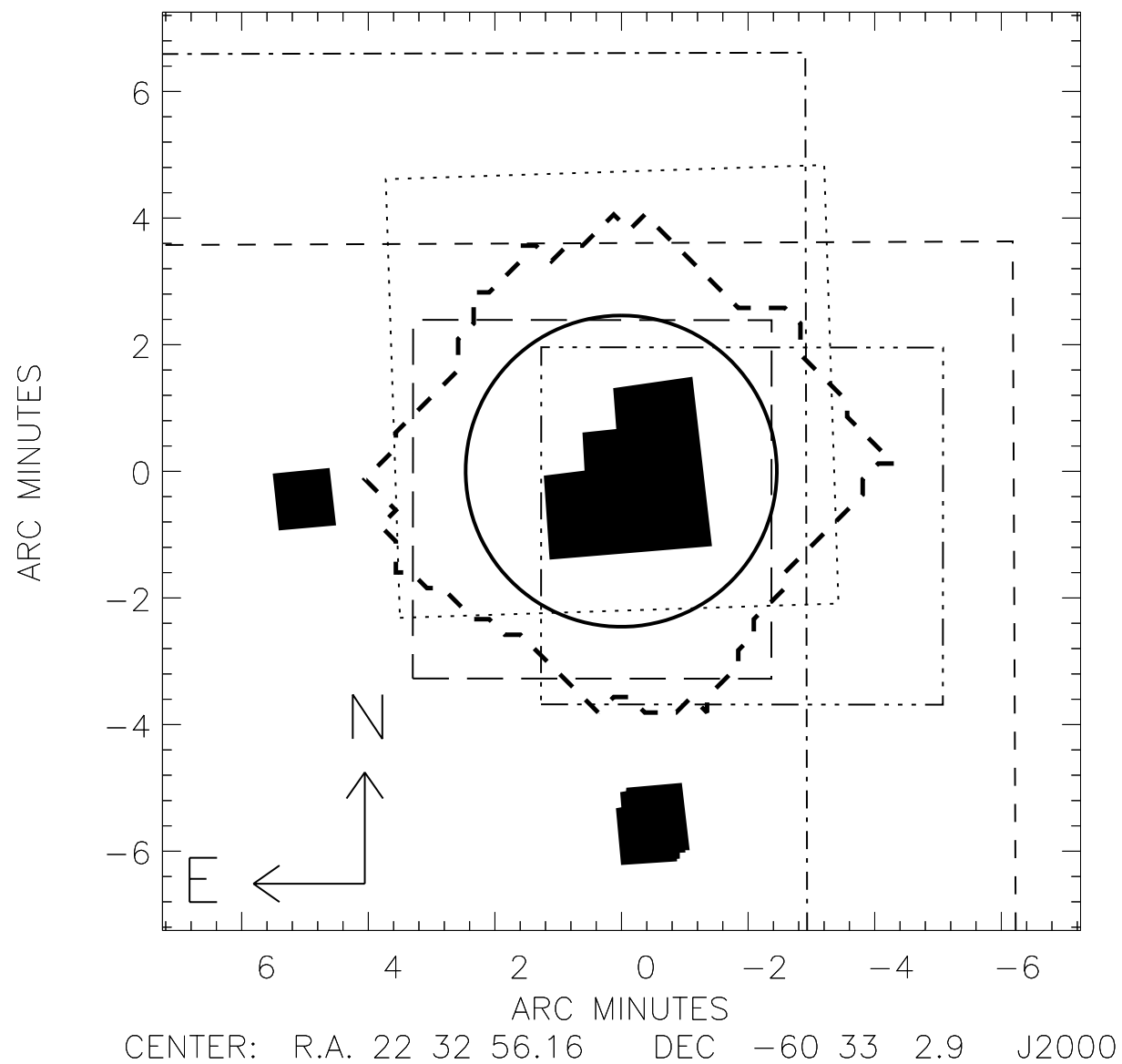
- At least 95% of MIR sources have optical counterparts

ELAIS MIR Extragalactic Source Counts



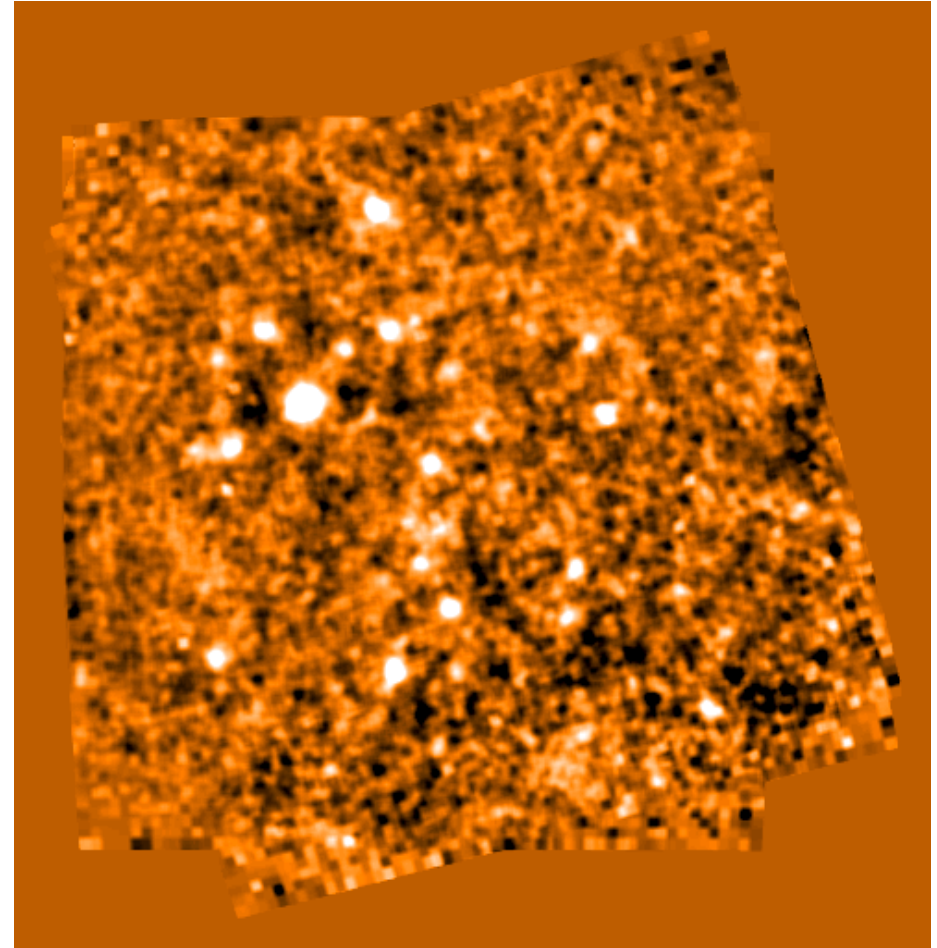
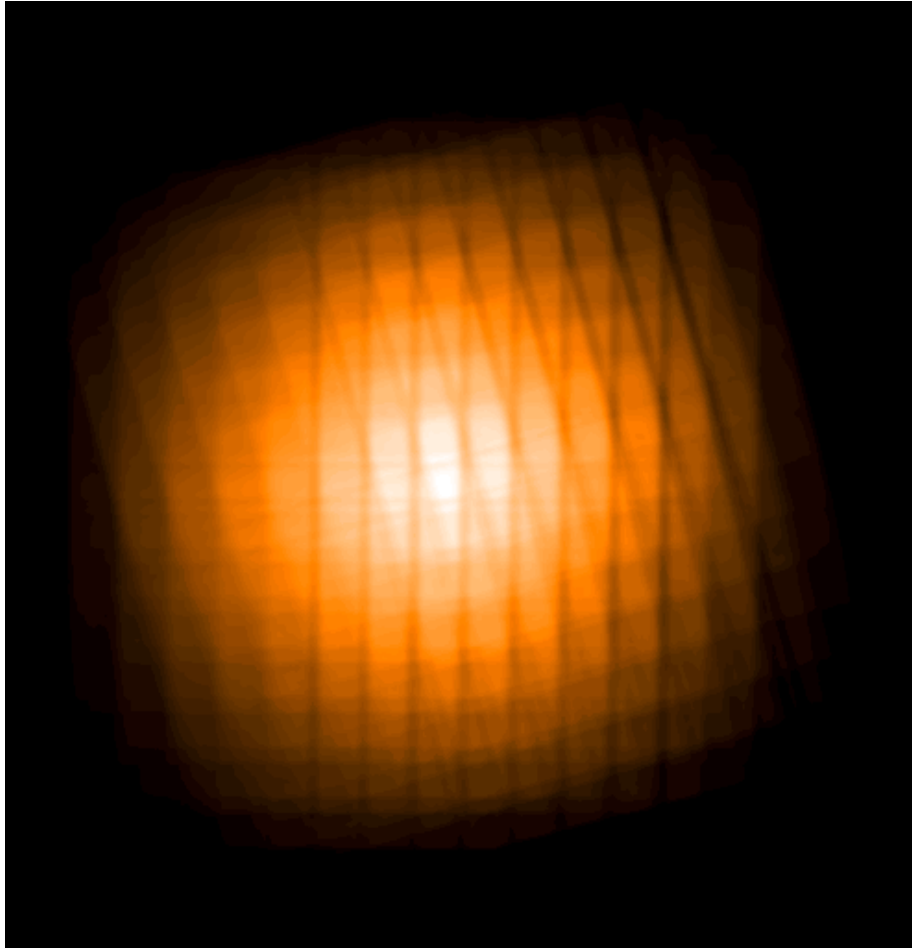
Abrupt slope change at $S_{15\mu m} \simeq 2$ mJy

HDFS



- 7 and 15 μm data
- 4+4 superposed rasters
- $\simeq 5'$ diameter
- Higher Redundancy

HDFS



- $\simeq 50$ $4\text{-}\sigma$ sources down to $S_{15\mu m} \simeq 0.1$ mJy
- Work in progress...

Results

- Well-tested software with a user-friendly GUI
- Source lists of great reliability and completeness
- Flux estimates await final checks!

Future Work

- Finalization of ELAIS 15 μm catalogues
- Reduction of 15 μm deep fields and clusters
- Reduction of ELAIS 90 μm fields
- ...