eSASS pipeline

Data from Moscow ground tests
Calibration data base
New eSASS users release, demo script
User feedback, bug reports, feature requests, etc.
Recent activities: SRCTOOL flux corrections
Astrometric correcitons
eSASS pipeline
All-sky survey SIXTE simulations & pipeline testing

Data from Moscow ground tests

- Testing campaigns in Moscow Dec. 2018 + Jan. 2019
- Dual data reception via socket connection +
  file based via IKI data exchange server
- Analysis via EGSE by eROSITA hardware team +
  FITS conversion for eSASS pipeline and NRTA
  (tmsplit, Ingo Kreykenbohm/Bamberg)

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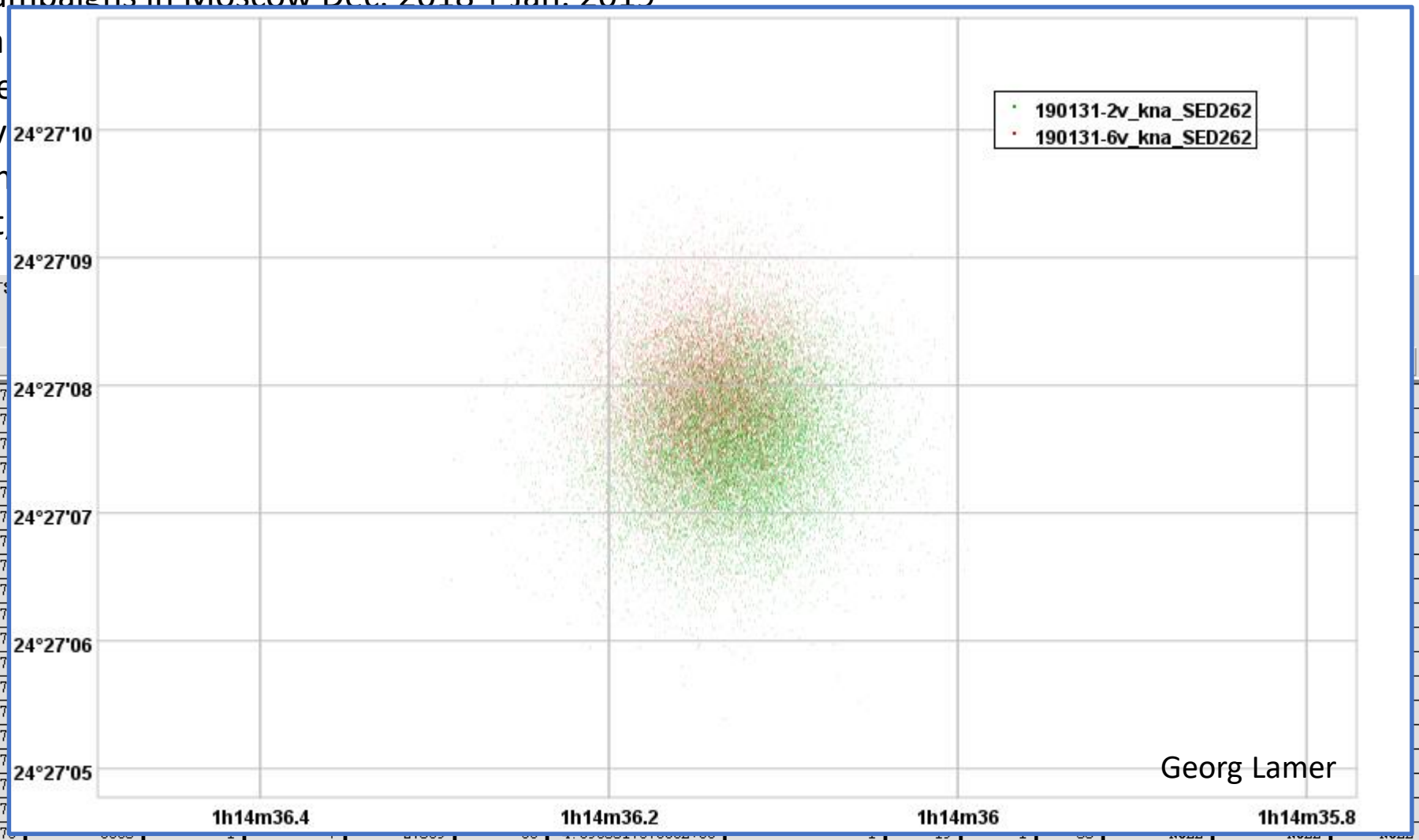
Data from Moscow ground tests

- Testing campaigns in Moscow Dec. 2018 + Jan. 2019
- Dual data
  file base
- Analysis v
  FITS con
  (tmsplit



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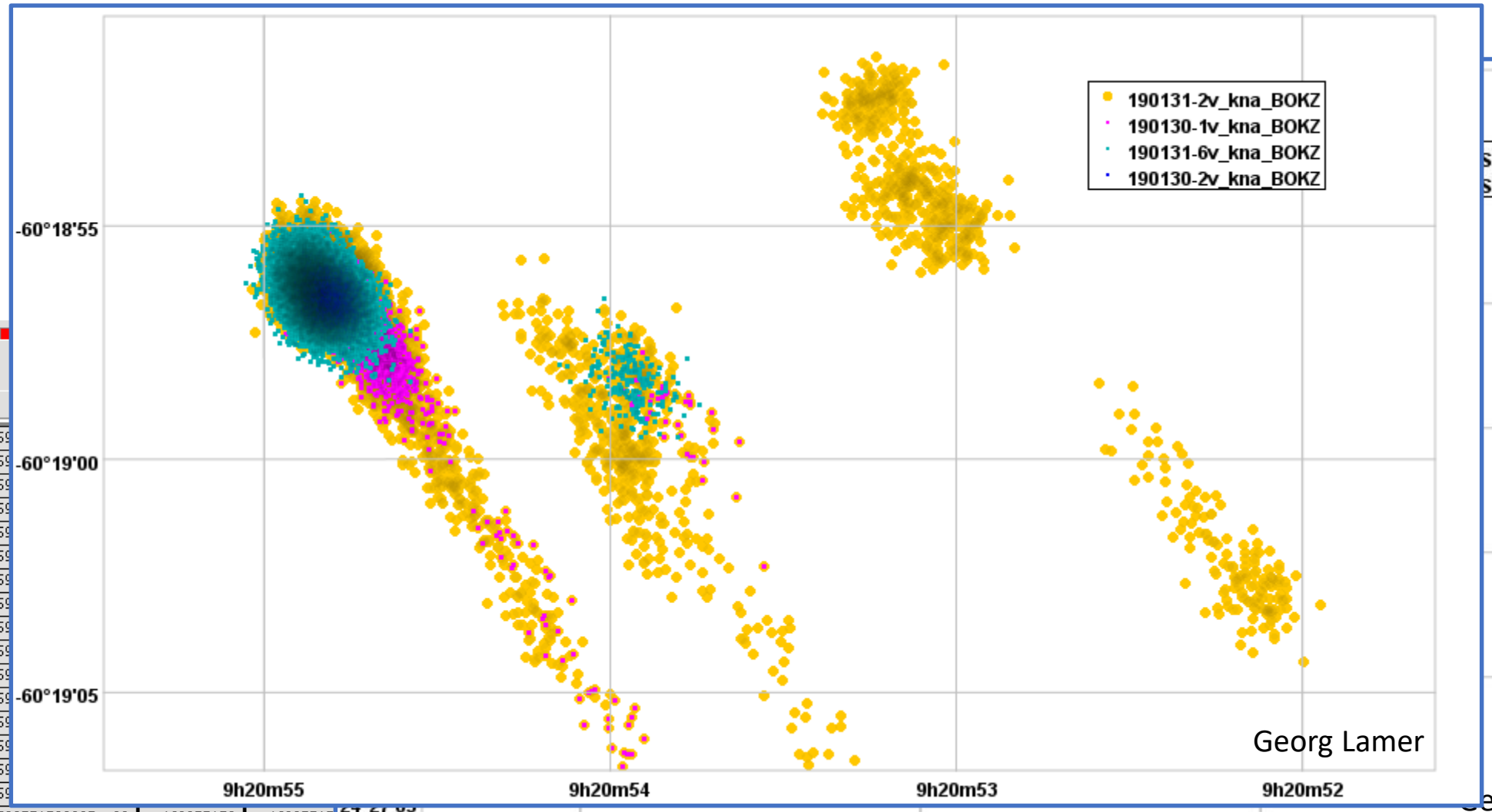
Data from Moscow ground tests



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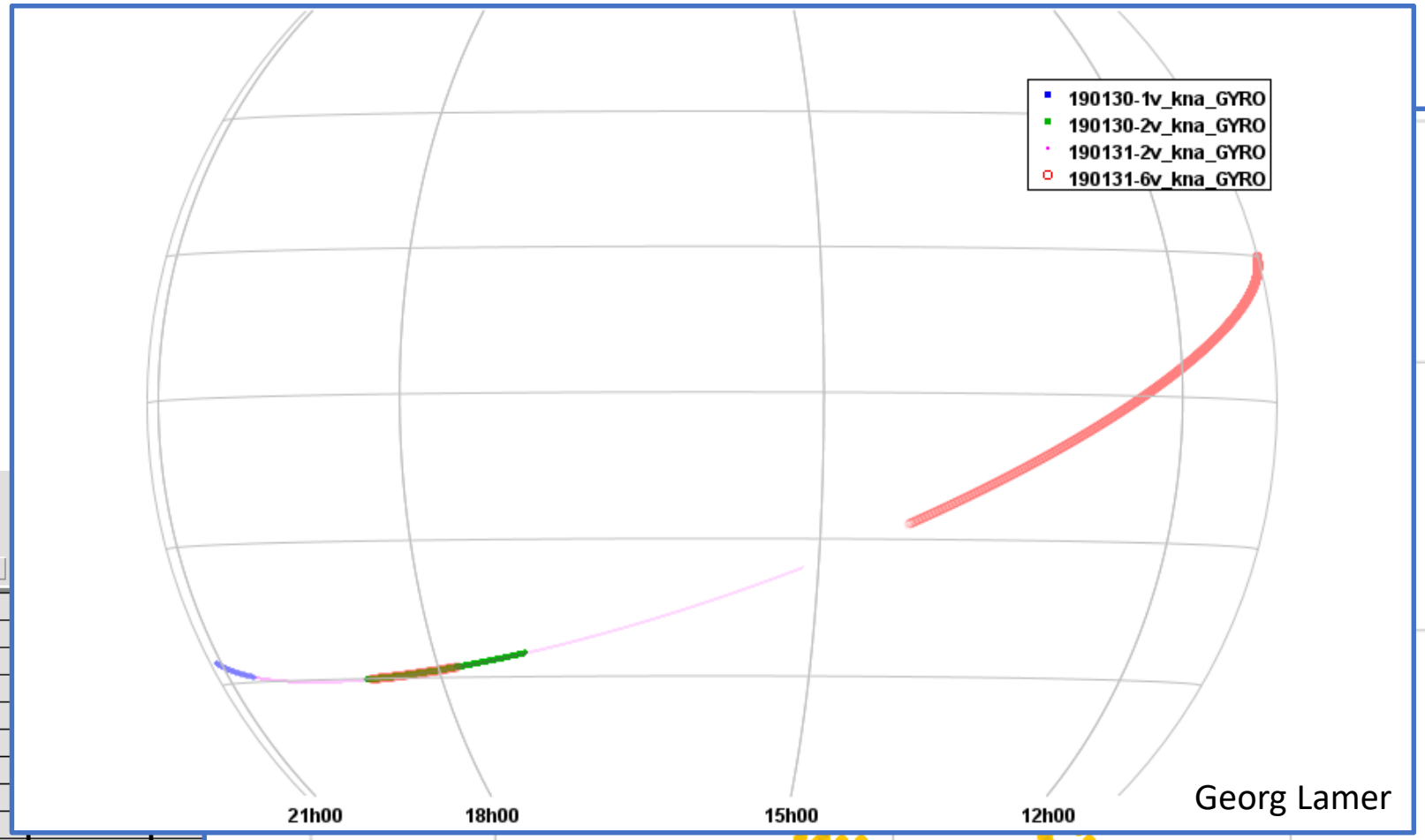

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20	3531430	4.698551733985E+08	469855173	469855173	6665	1	7	27589	38	4.698551737800E+08	1	20	1	55	NULL	NULL	NULL

eRoSITA calibration databas (caldb)

caldb (HEASARC standard) calibration database with additional indexing scheme to support different calibration versions for each eSASS release – NEW: change logs in caldb directory

Telescopes				
2DPSF (P/S)	ERBOX	ERMLDET	SRCTOOL	
SLET_PSF	ERMLDET	APETOOL	ERSENSMAP	
TVIGNET	EXPMAP	SRCTOOL		
Detectors				
ENERGY	ENERGY			
BADPIX	FTFINDHOTPIX	PATTERN	EXPMAP	SRCTOOL
OFFSETS	EVPREP			
MIPSMAP	EXPOSURE	EXPMAP		

Cal file type	eSASS task

Spectra			
RMF (STD/FINE)	SRCTOOL		
ARF (STD/FINE)	SRCTOOL		
Timing			
TIMECORR	EVPREP	ATTPREP	TIMECORR
Spatial			
FOVMAP	EXPMAP	SRCTOOL	BACKGRND
DETMAP	EXPMAP	SRCTOOL	BACKGRND
Attitude			
SED1/2	BOKZ	GYRO	ATTPREP
General			
INSTPAR	TELATT	EVATT	

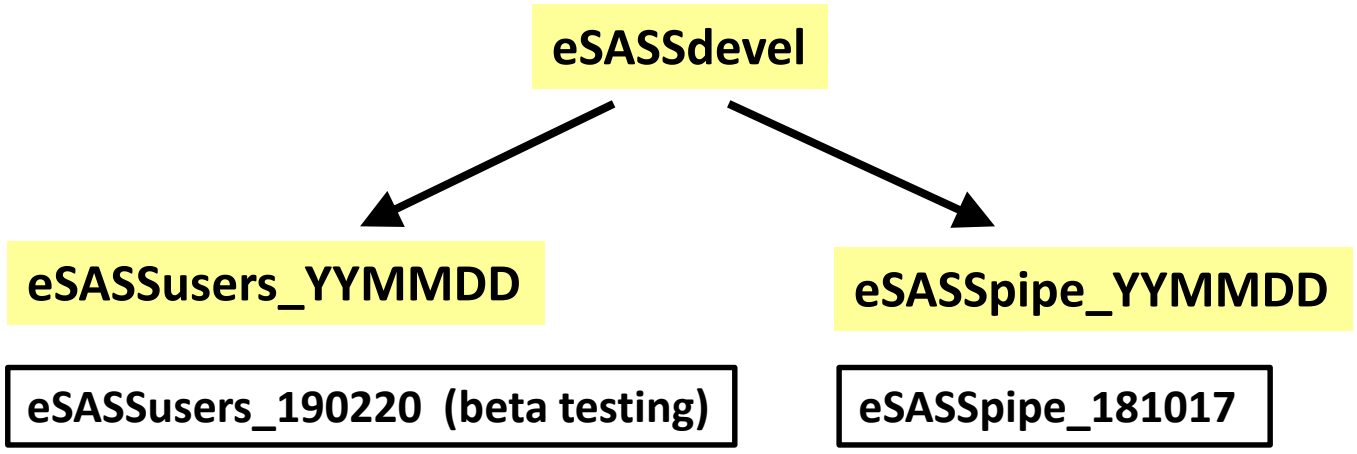
Cal file type	eSASS task

Working with eSASS – new users release

Interactive analysis

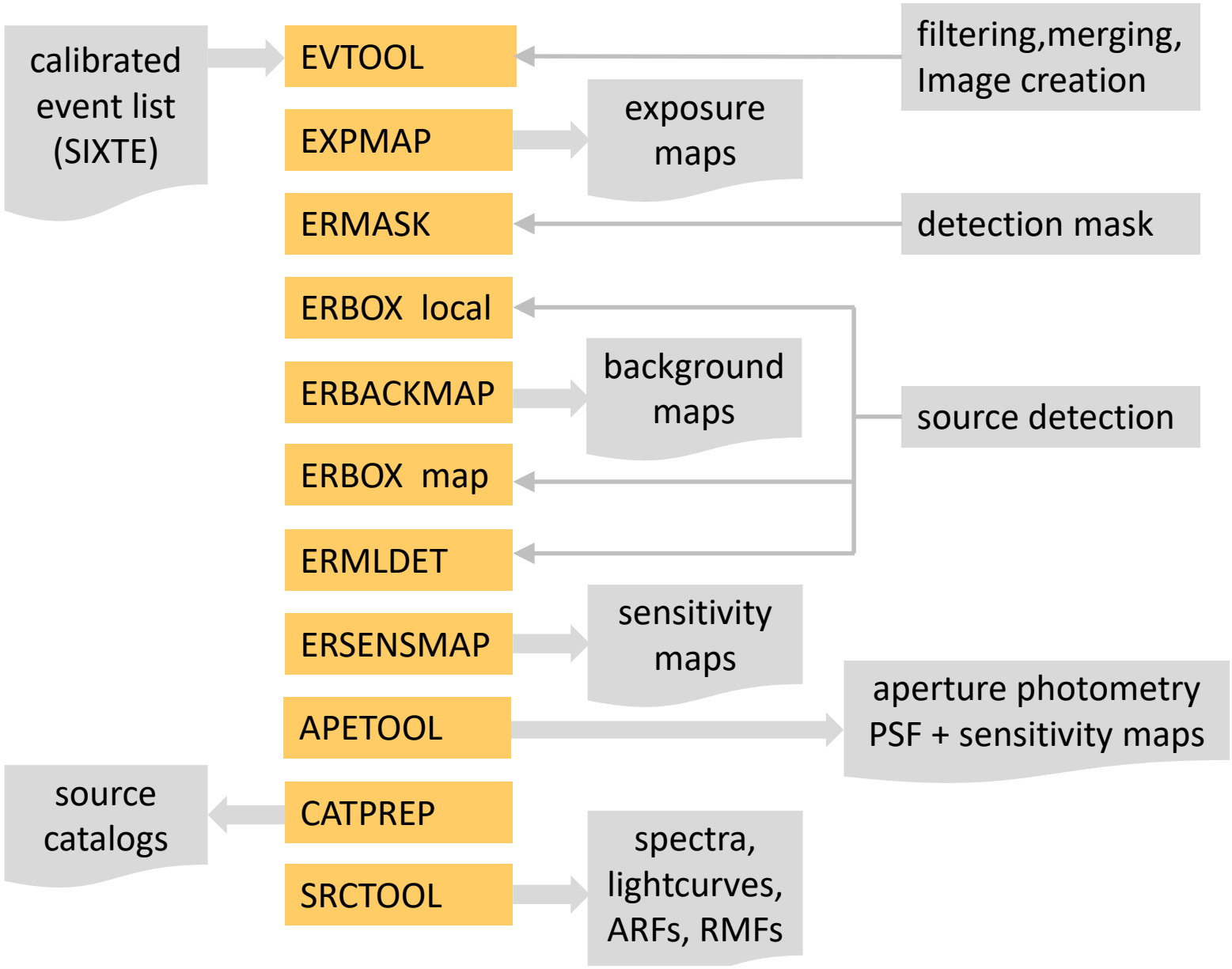
EVTOOL	SRCTOOL
FLAREGTI	
EXPMAP	ERBACKMAP
ERMASK	ERSENSMAP
ERBOX	ERMLDET
APETOOL	CATPREP
TIMECORR	BARYCORR
PATTERN	ENERGY
EVATT	RADEC2XY

Installing and working with eSASS:
https://wiki.mpe.mpg.de/eRosita/eSASS
eSASS info pages (interactive + pipeline):
http://erosita.mpe.mpg.de/eROdoc
eSASS download area (follow instructions in wiki):
http://erosita.mpe.mpg.de/eSASS-download/
eSASS helpdesk: eROSITA-helpdesk@mpe.mpg.de
Mailing list: eROcat@lists.mpe.mpg.de



(new autoconf by Philipp Weber – experimental)

eSASS demo script



User feedback, bug reports, feature requests, …

SIXTE/eSASS flux inconsistencies (SRCTOOL, ERMLDET fluxes)

- Florian Pacaud + Bonn team
- MPE: Teng Liu and others
- Thomas Dauser + Bamberg SIXTE team

Mostly solved (ongoing) ⇨ eSASS Q+A splinter

Suggestions for eSASS upgrades

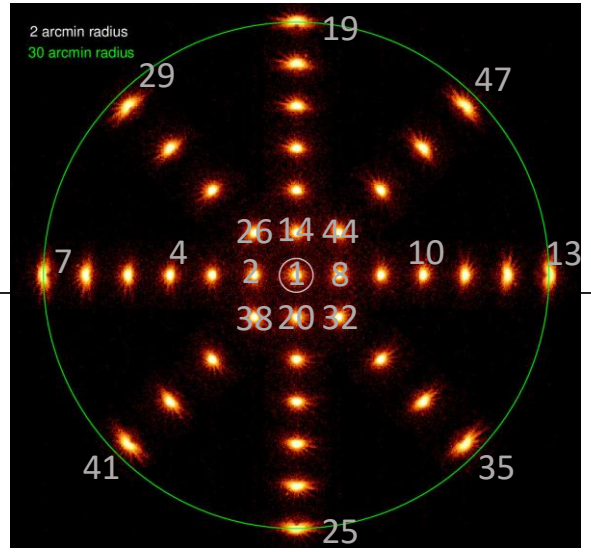
- Miriam Ramos + Bonn team
- Teng Liu
- Alexis + team

⇨ eSASS Q+A splinter

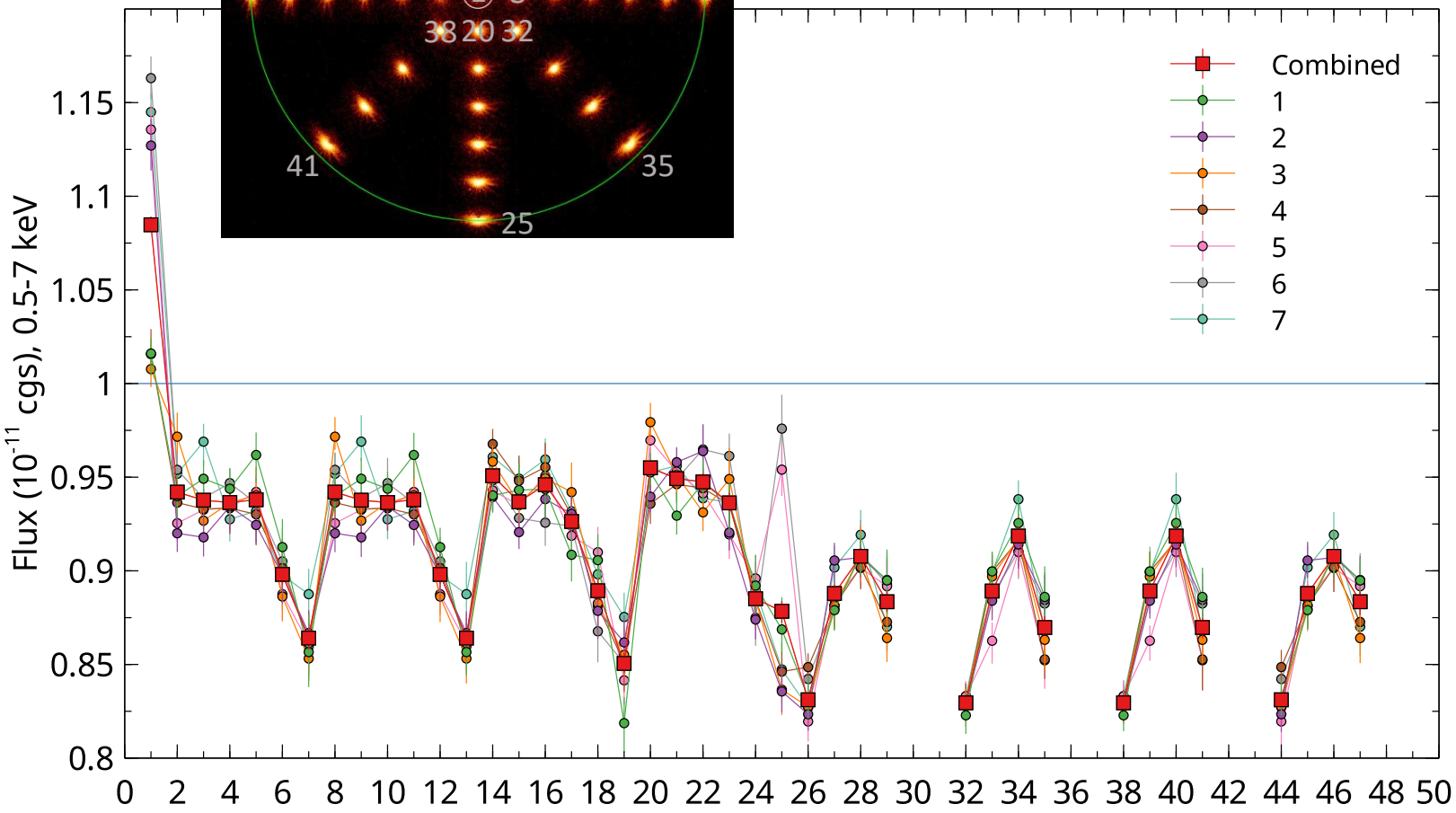
eSASS science requirements meetings ⇨ monthly eSASS user telecons

Fluxes of SRCTOOL extracted spectra as a function of position

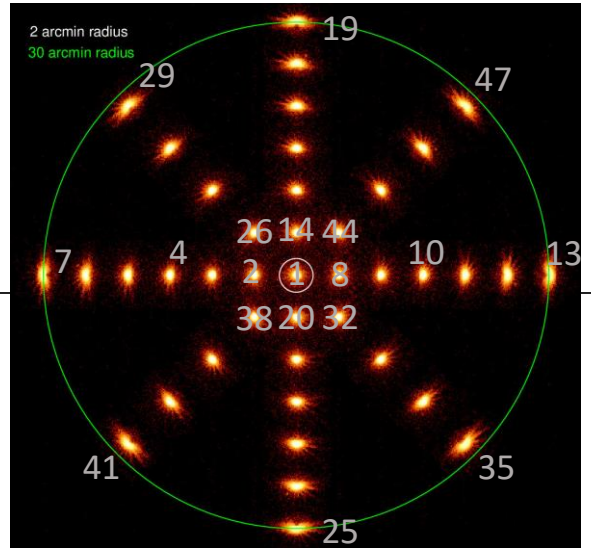
SRCTOOL was using an old PSF based on ray-tracing simulations



PSF provided by Konrad Dennerl

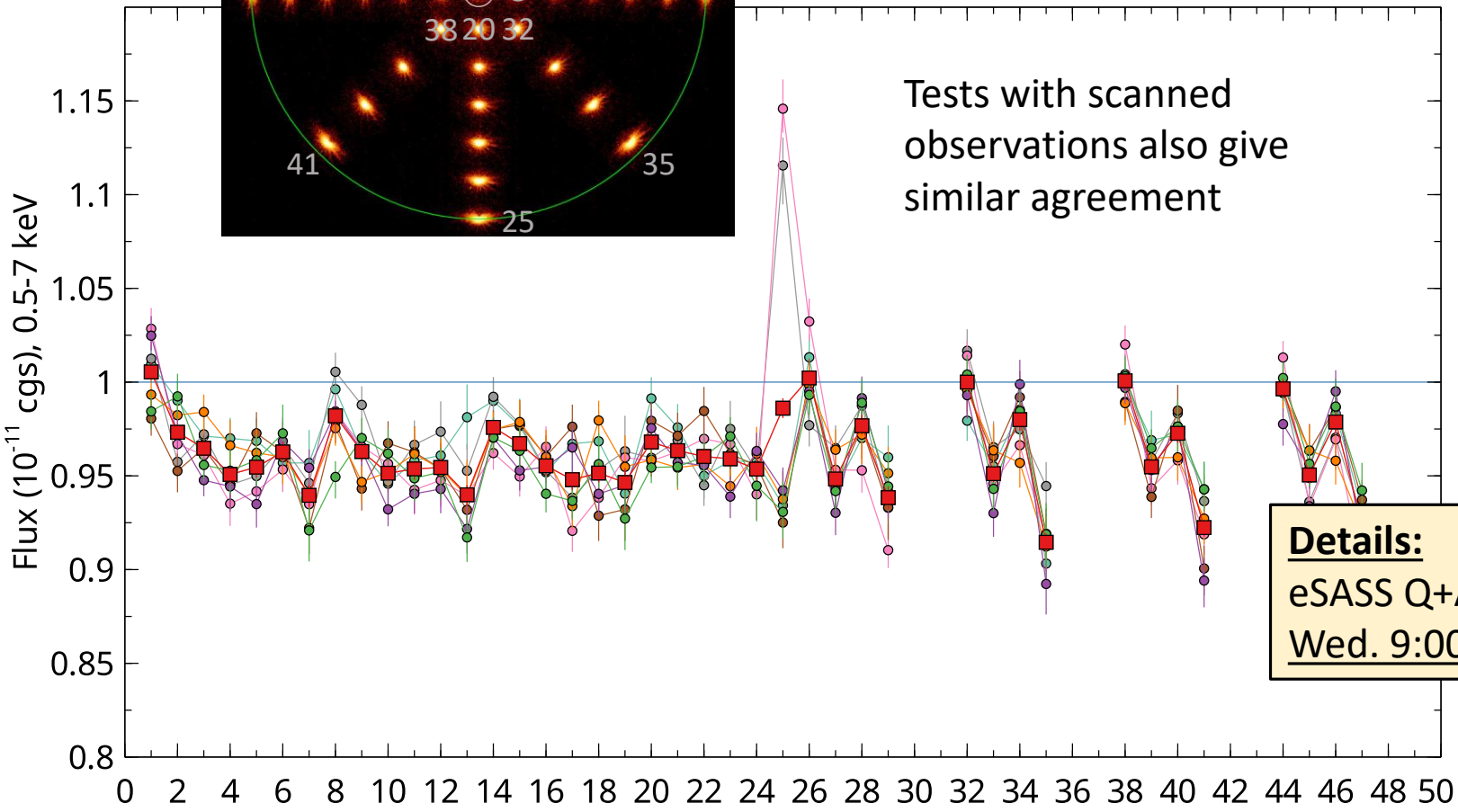


Fluxes of SRCTOOL extracted spectra as a function of position



Updated SRCTOOL PSF using PANTER images to better match SIXTE PSF: now agrees to around 5%

PSF provided by Konrad Dennerl



Details:
eSASS Q+A splinter session
Wed. 9:00 – 10:30

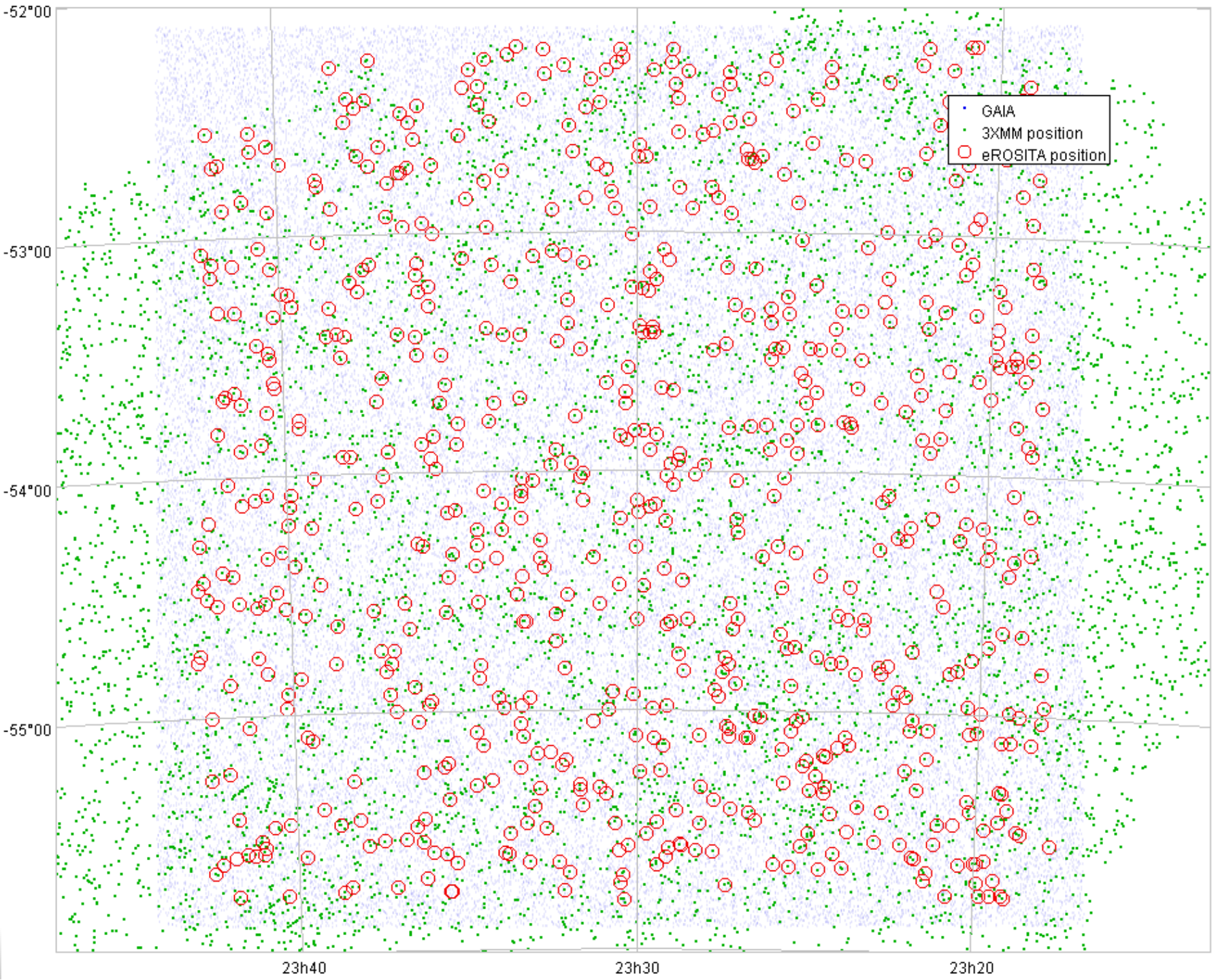
Astrometric corrections

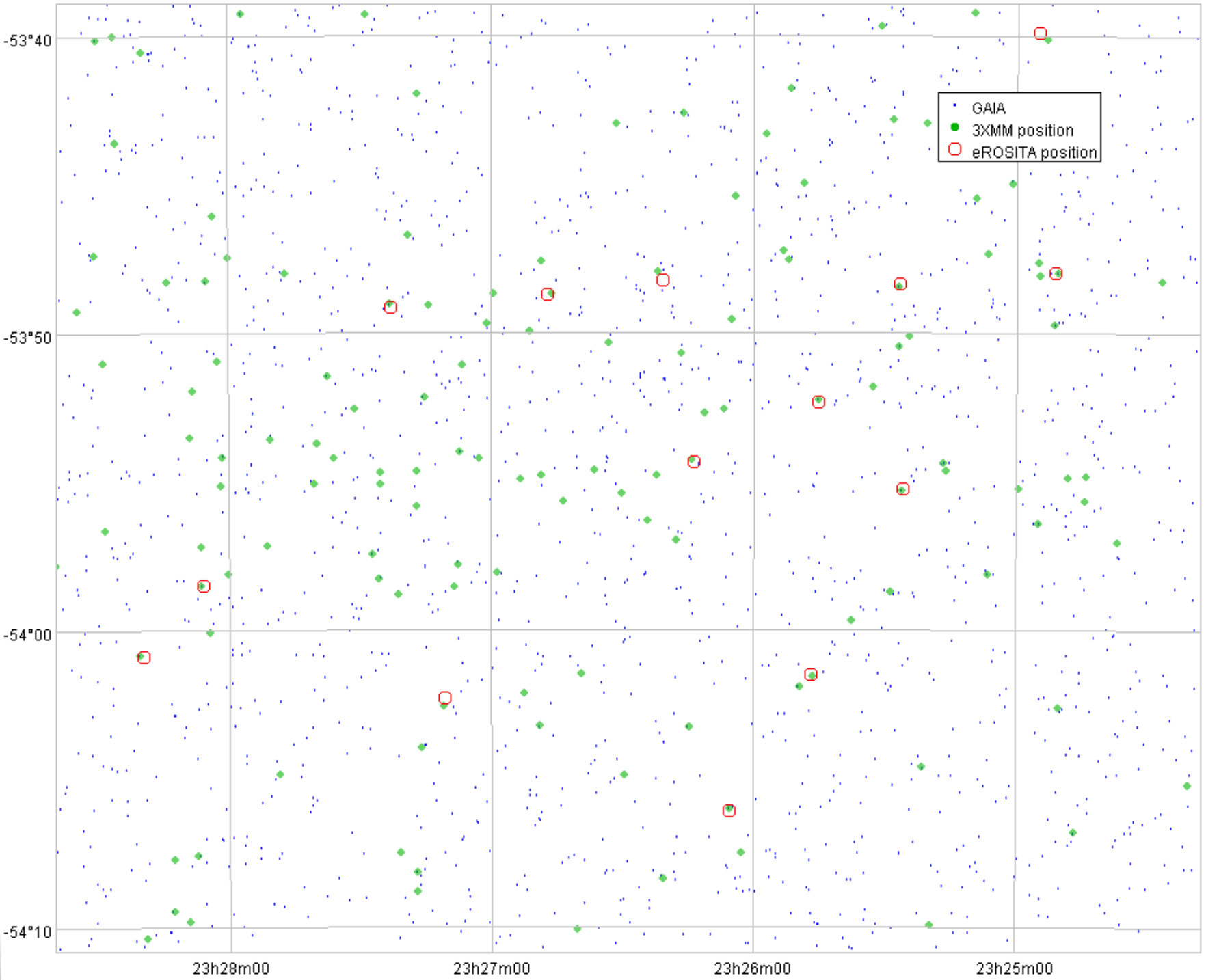
- Mara Salvato (catalogs, NWAY)
- Long Ji (NWAY based algorithm)
- Georg Lamer (testing, eSASS implementation)

✓ 3XMM in XMM-XXL field south as input list
✓ SIXTE simulation of eROSITA sky tile
✓ After source detection +10 arcsec offset to the DEC positions
✓ NWAY based astrometric correction algorithm with
  - GAIA optical reference and
  - NWAY weights from position in WISE W2 vs. W1-W2 plane

<u>Result:</u>

➢ -9.25" in DEC and -0.69" in RA correction
➢ Remaining offset: 1.03“


-52°00
-53°00
-54°00
-55°00
23h40
23h30
23h20
GAIA
3XMM position
eROSITA position


GAIA
3XMM position
eROSITA position
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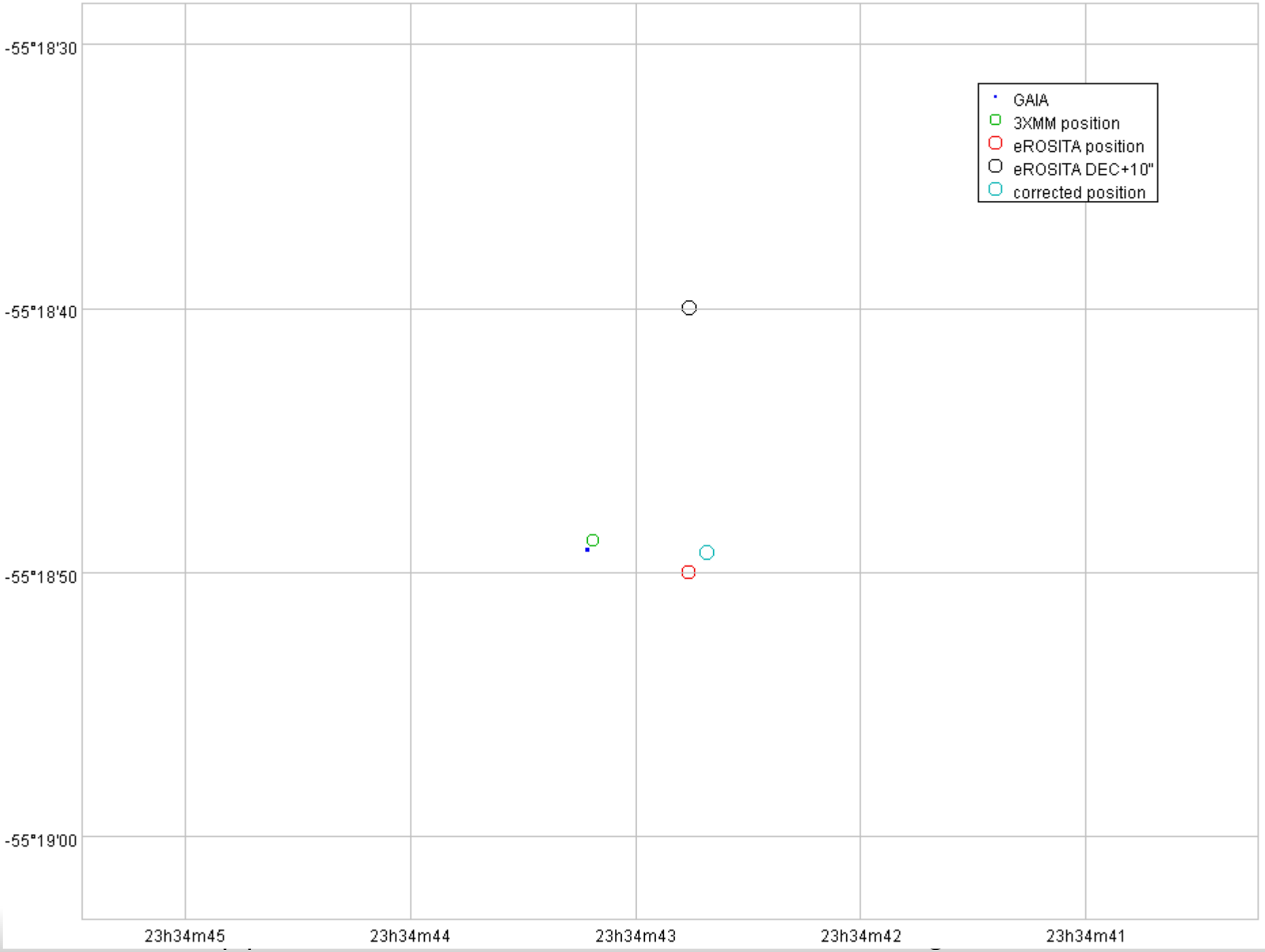
-53°50
-54°00
-54°10
23h28m00
23h27m00
23h26m00
23h25m00


-55°18'30
-55°18'40
-55°18'50
-55°19'00
23h34m45
23h34m44
23h34m43
23h34m42
23h34m41
GAIA
3XMM position
eROSITA position
eROSITA DEC+10"
corrected position

Pipeline processing

EROPIPE
triggers pipeline chains, updates pipeline status, load balancing

input data frames
(science, HK, attitude, etc)
mirrored from IKI/Moscow

Preprocessor:
FITS conversion
packaging in eROdays
test for completeness
archiving

NRTA&QL analysis:
onitoring
k science

SASS TEL chain:
(one per telescope)
event calibration
quality GTI
copy to survey/pointing staging areas

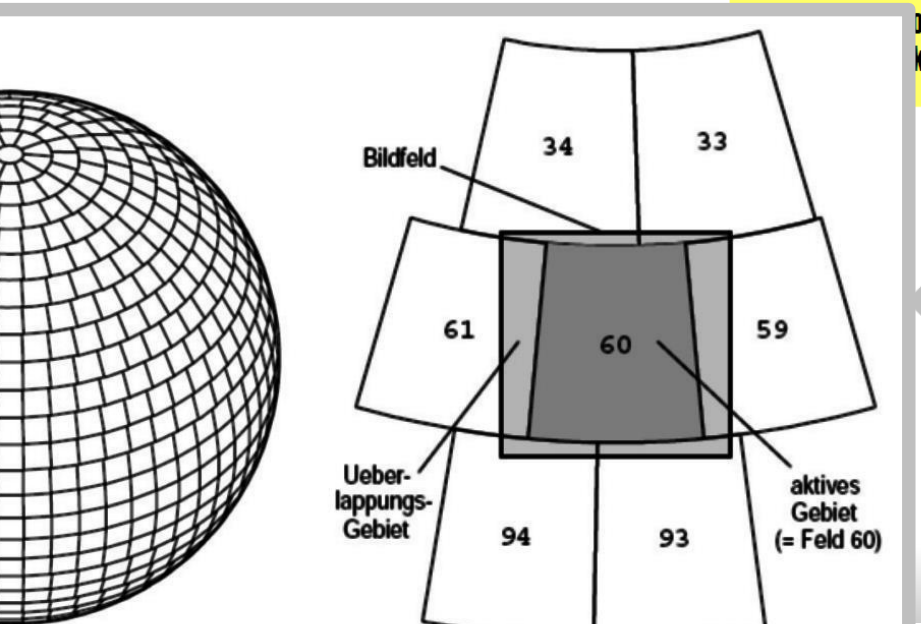
survey/pointing staging areas

SASS EXP chain:
collect from staging areas &
merge event files
make images & exposure maps

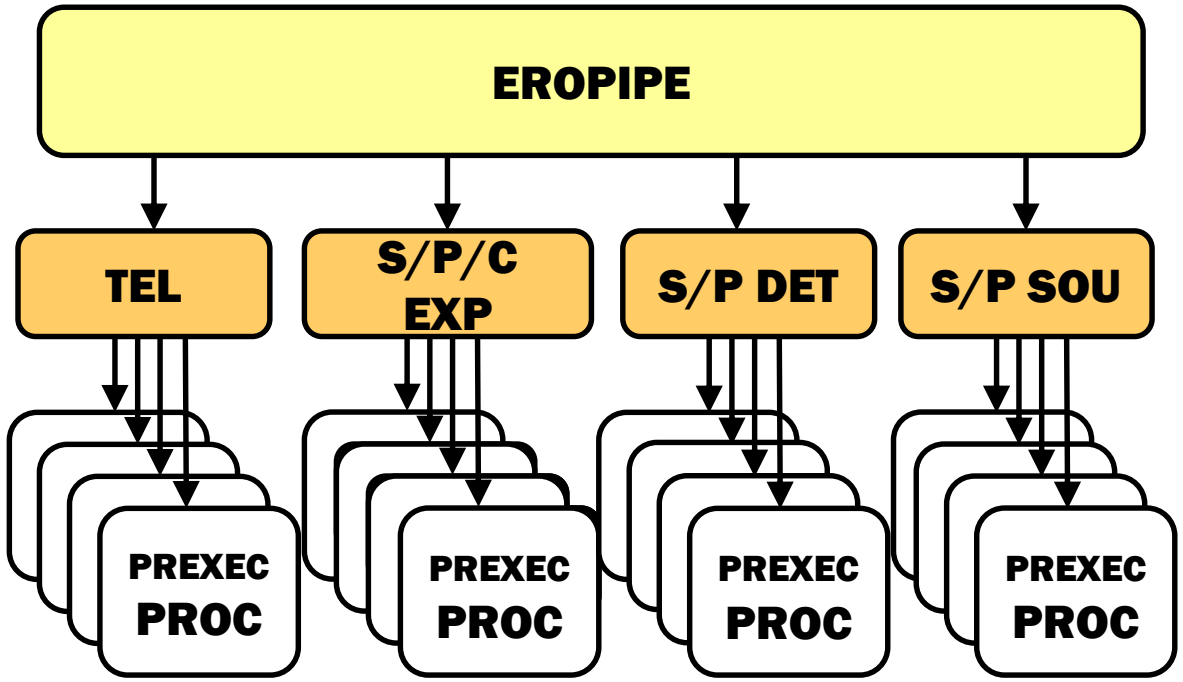
SASS DET chain:
perform several source detection &
characterization algorithms
make backgroud & sensitivity maps

SASS SOU chain:
make source specific products
(spectra, time series, etc.)

raw data | archive | products



Pipeline control



Pipeline control program: initiates processing of task chains, prepares chain parameter files, updates and reads processing status files

200+ processing chains are executes concurrently on eROSITA servers, several pipeline configurations (and eSASS releases) may be be active in parallel

SIXTE simulations for pipeline testing

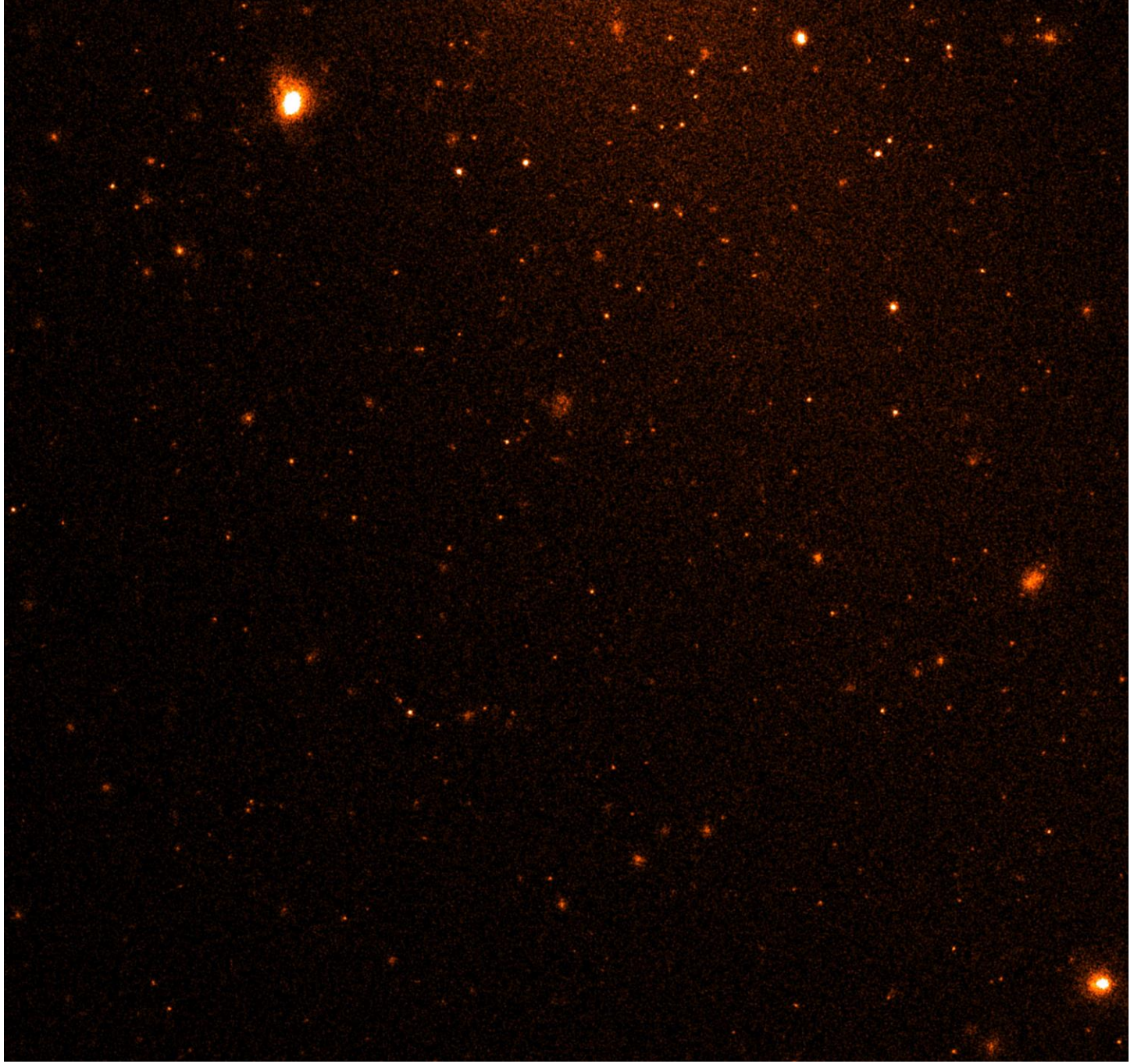
Christoph Großberger, Philipp Weber + Bamberg SIXTE team

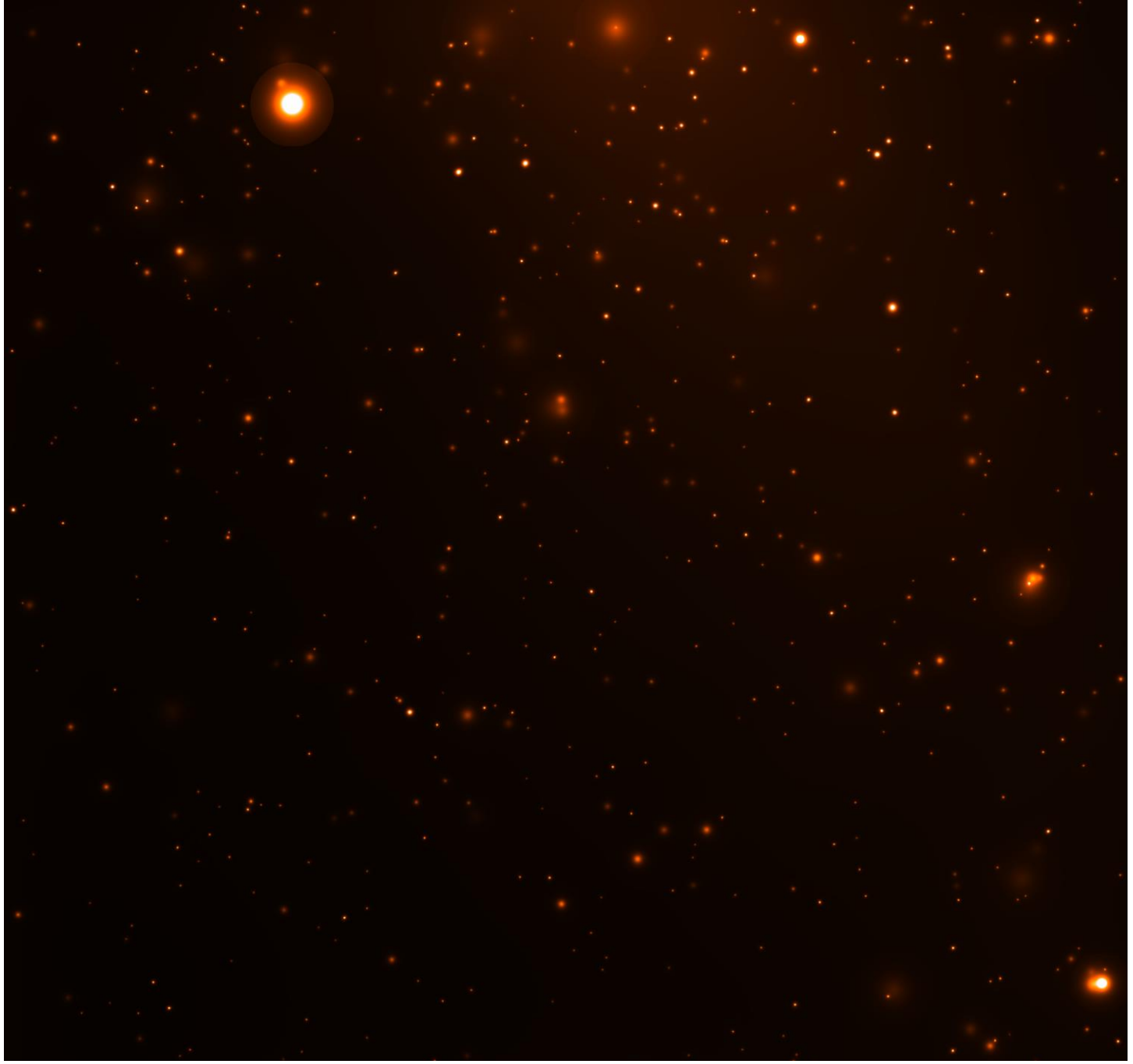
- One year all-sky survey simulation
  Inputs for SIMPUT: AGN (Nicolas Clerc)
  Cluster images (Jermy Sanders)

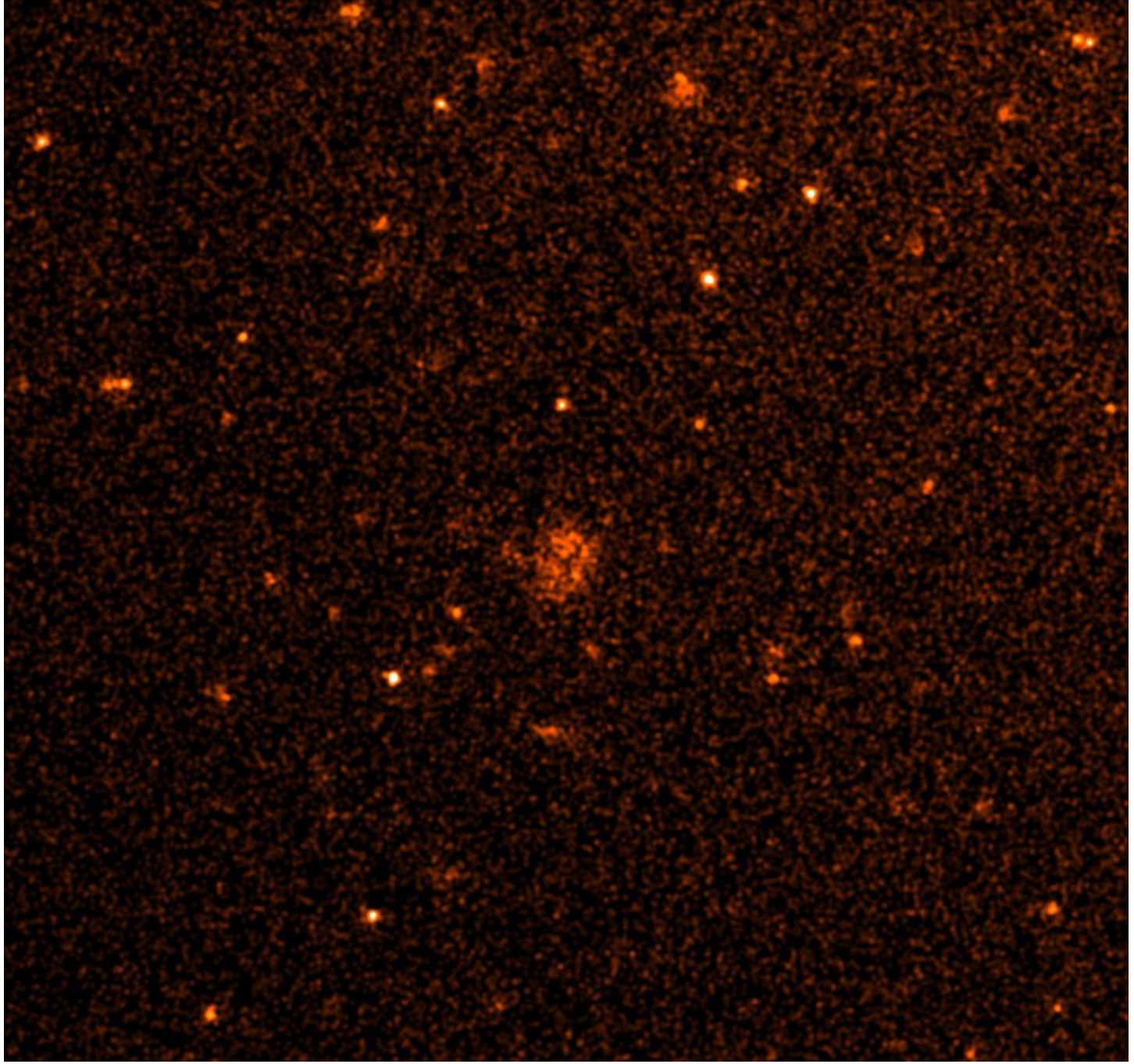
- New all-sky survey simulation after
  - SIXTE/eSASS coordinate system corrections:
    RAWX/RAWY, roll angles – Thomas Dauser, Georg Lamer
  - Improved SIMPUT, inputs by Johan Komparat, Jeremy Sanders, Joe Mohr + team
  - New attitude file (Jan Robrade)

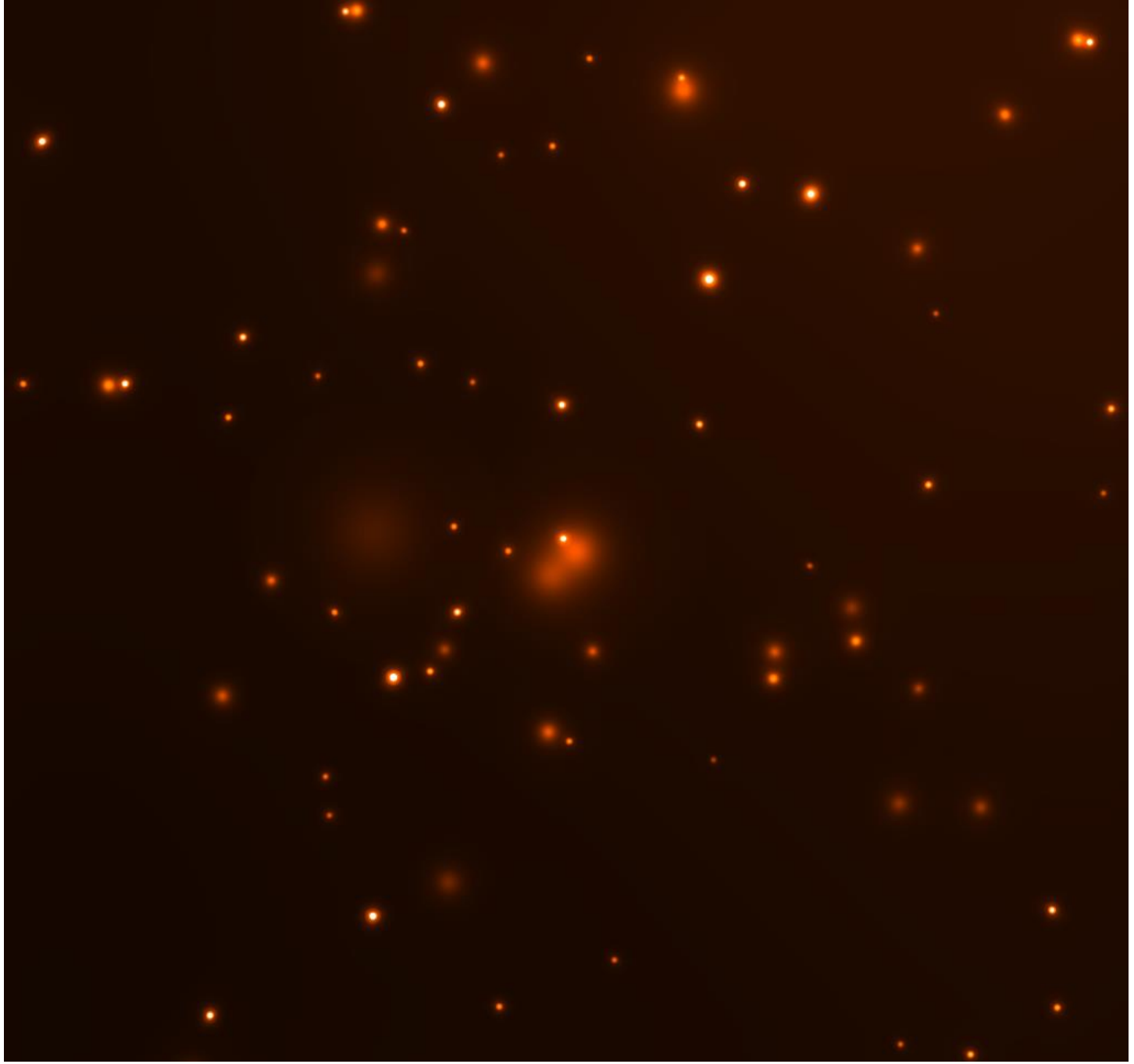
- Full CalPV simulation (same simput + targets)

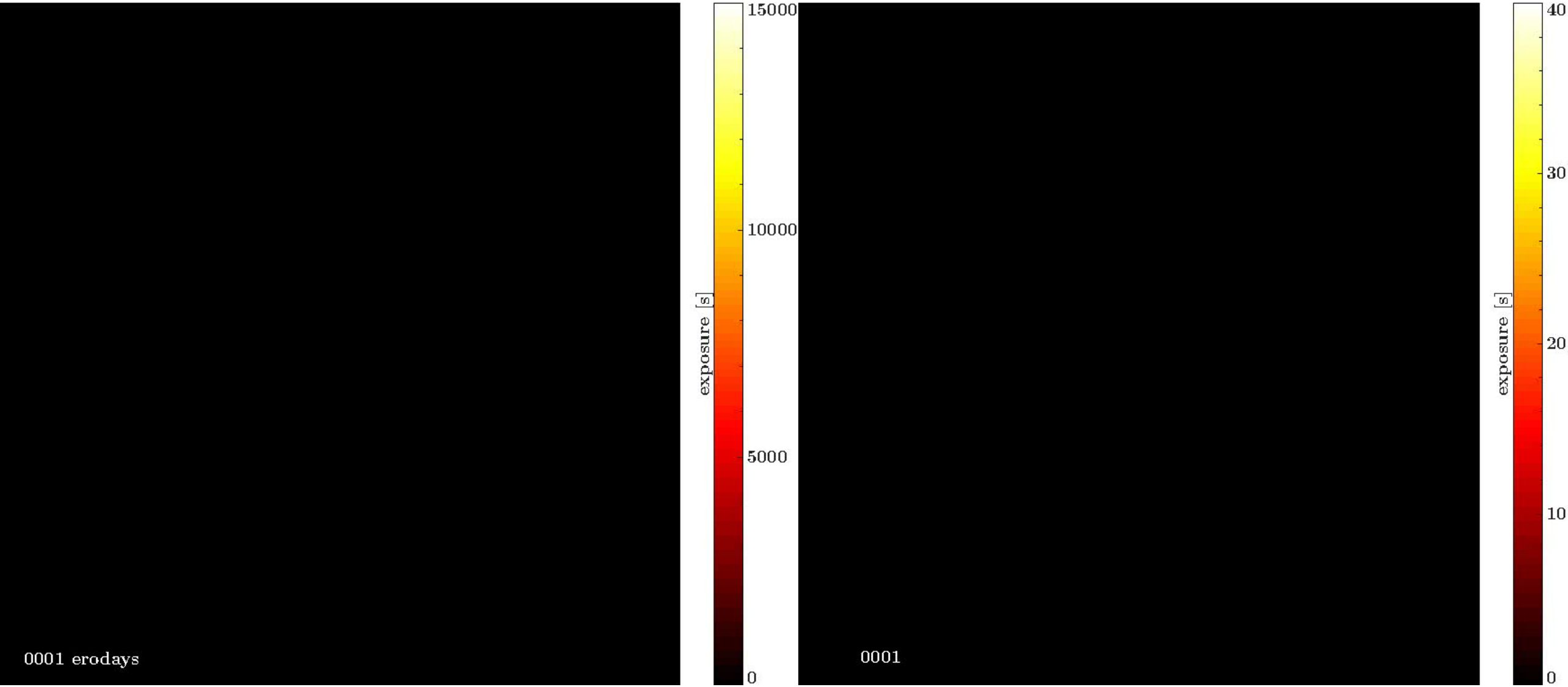
Example dataset: eRASS1 simulation of deep all-sky survey tile:
exposure map – photon image – ERMLDET source map
movies: 20 eROdays/s - processing+movies by Christoph Großberger







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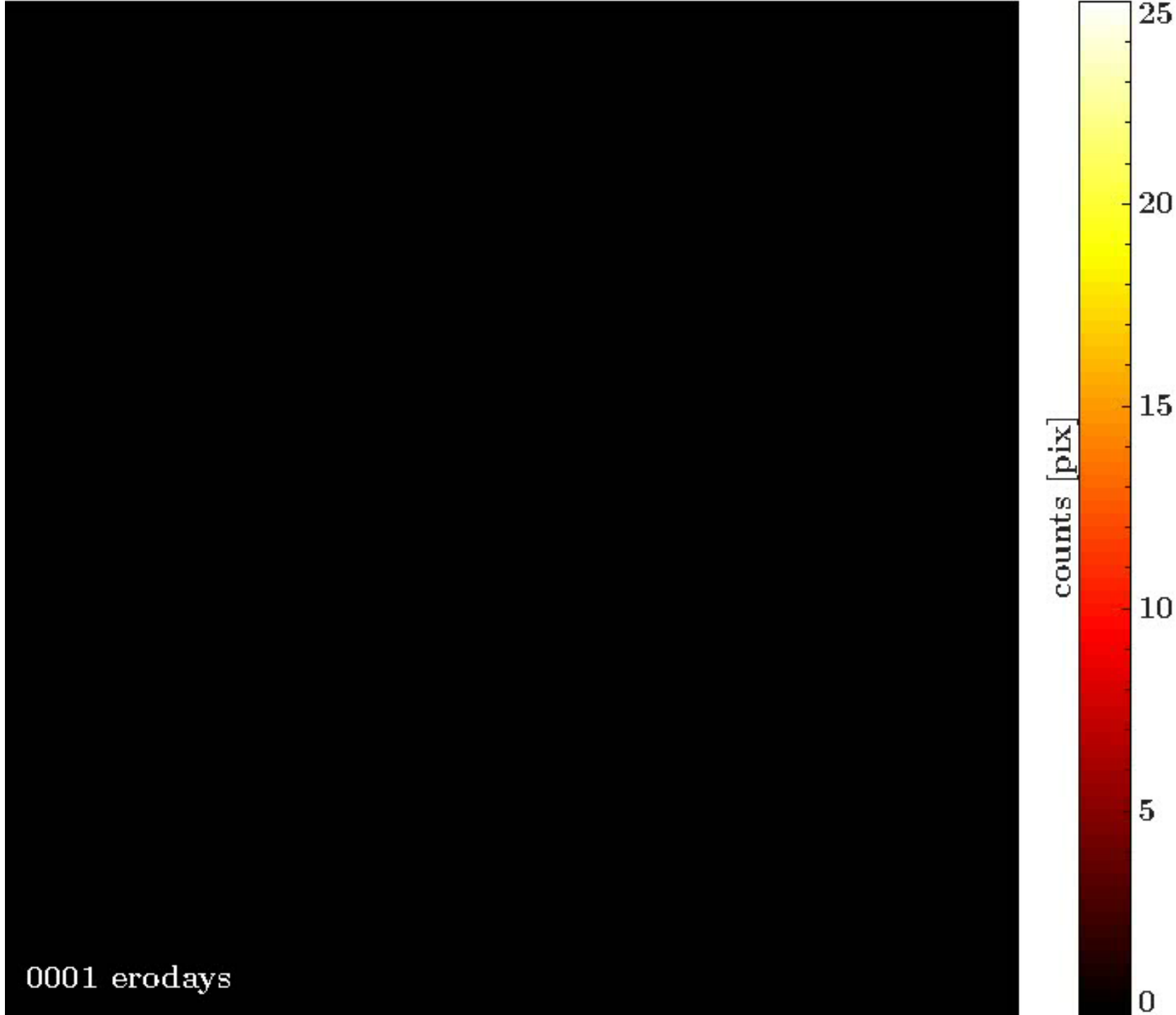
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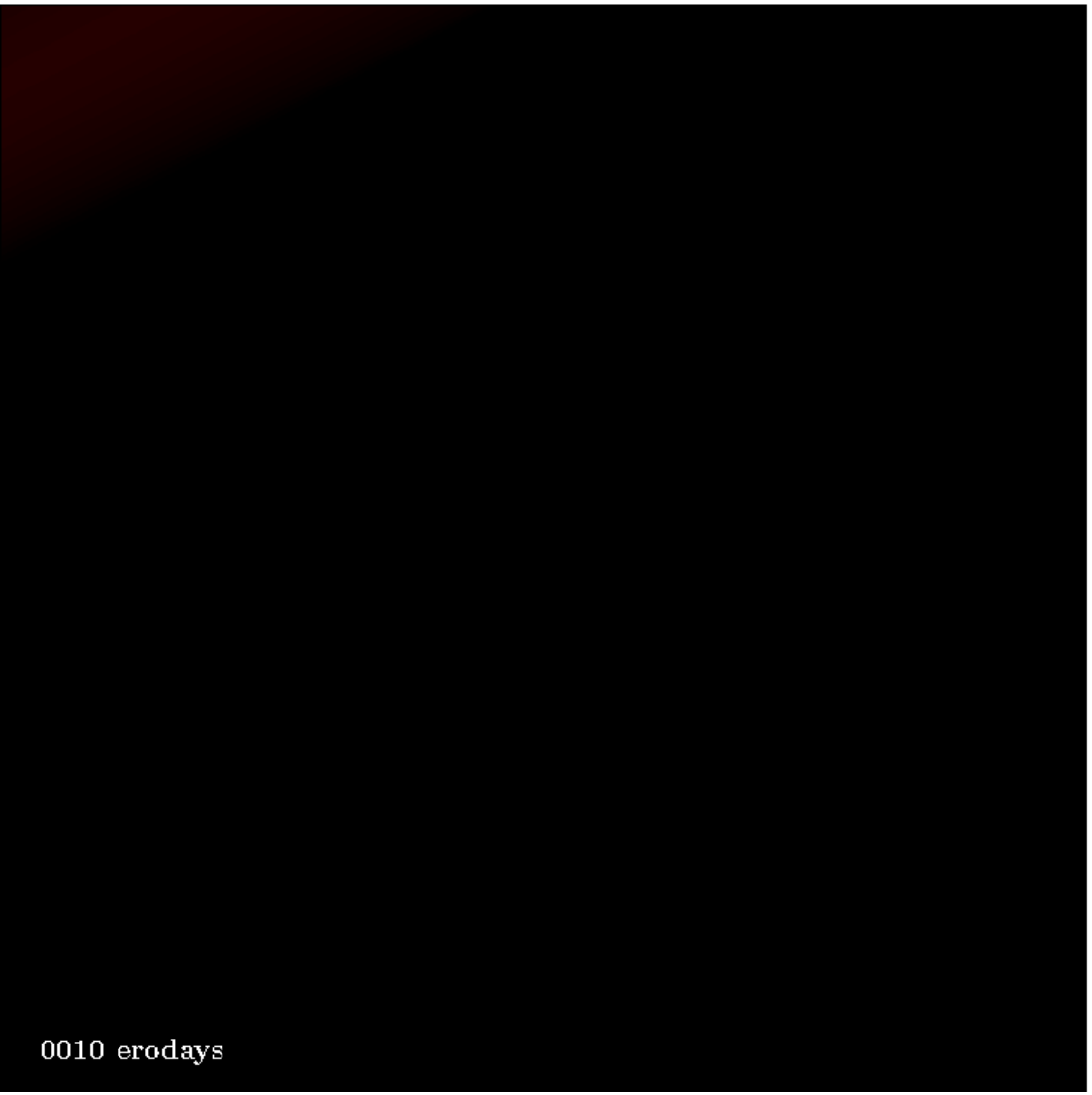
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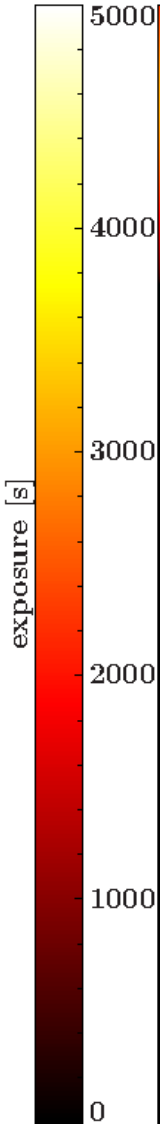
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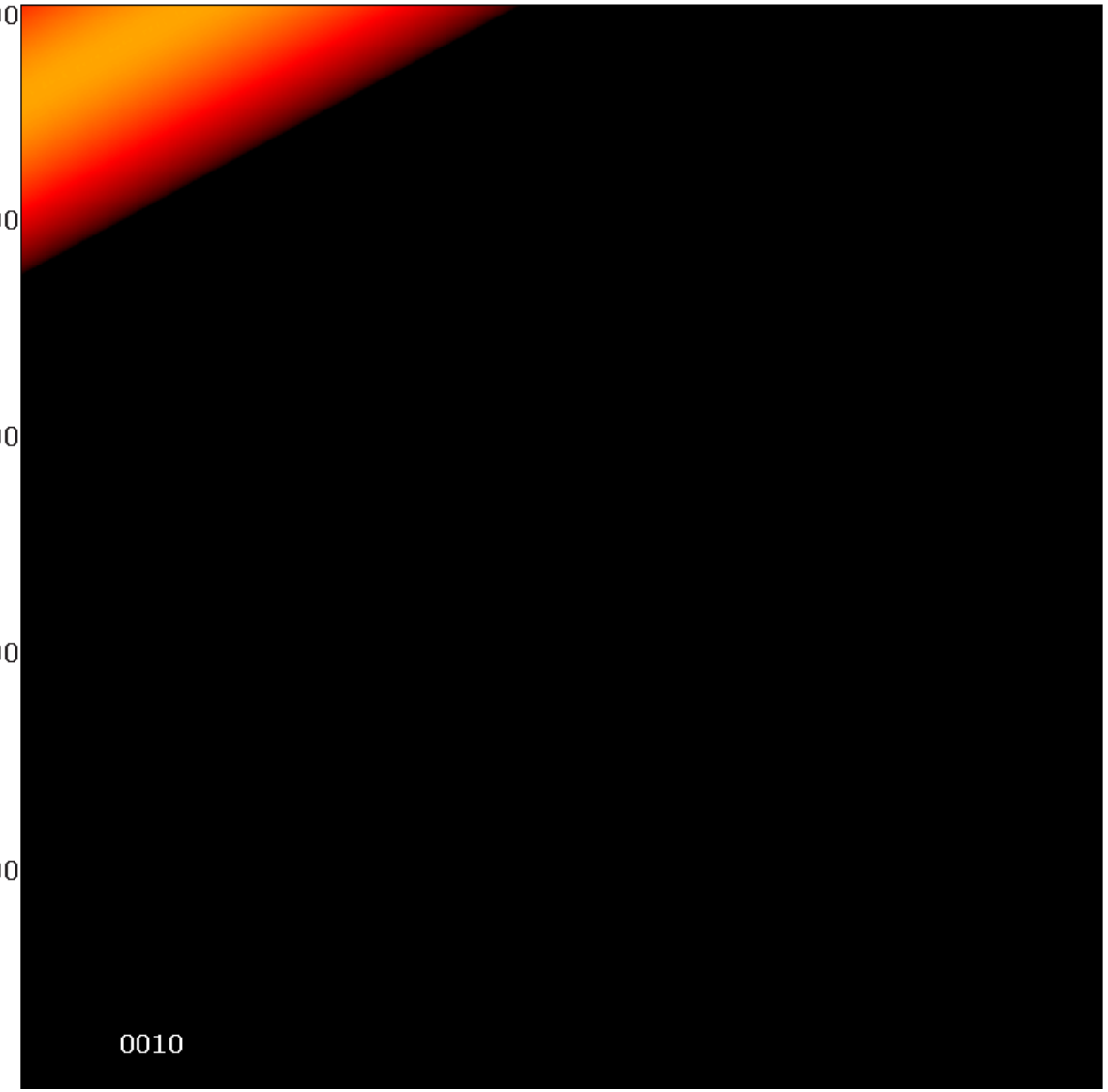
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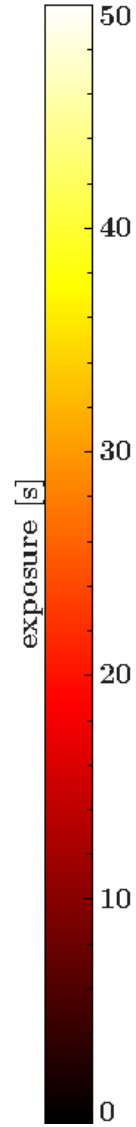
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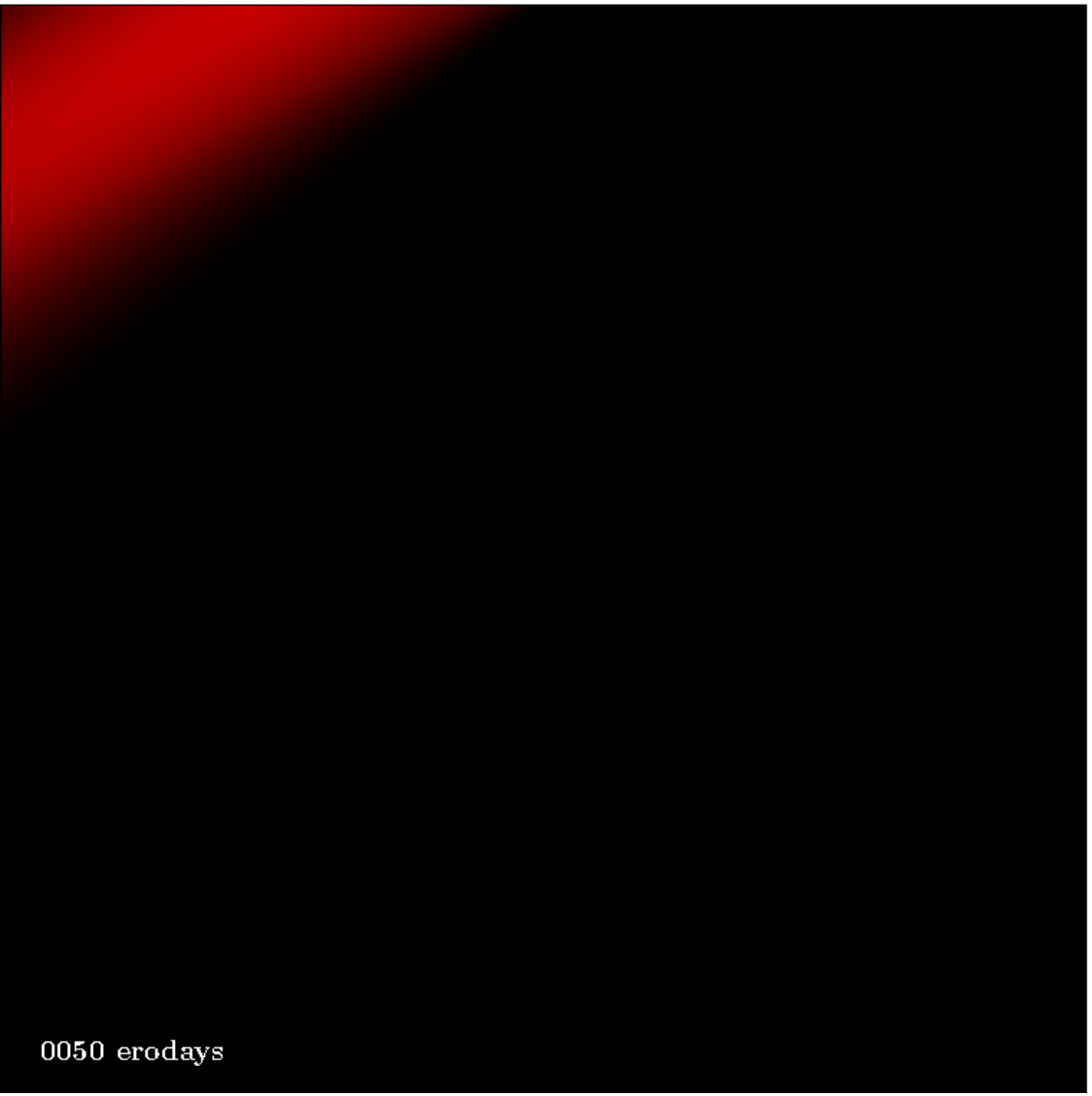
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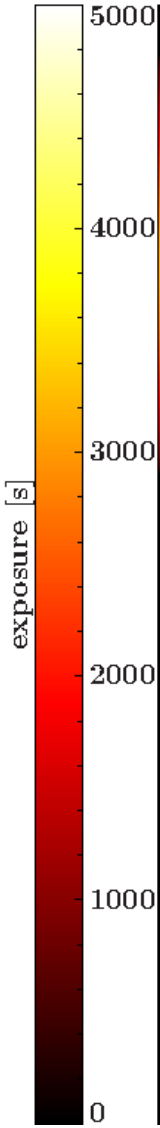
exposure [s]
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4000
3000
2000
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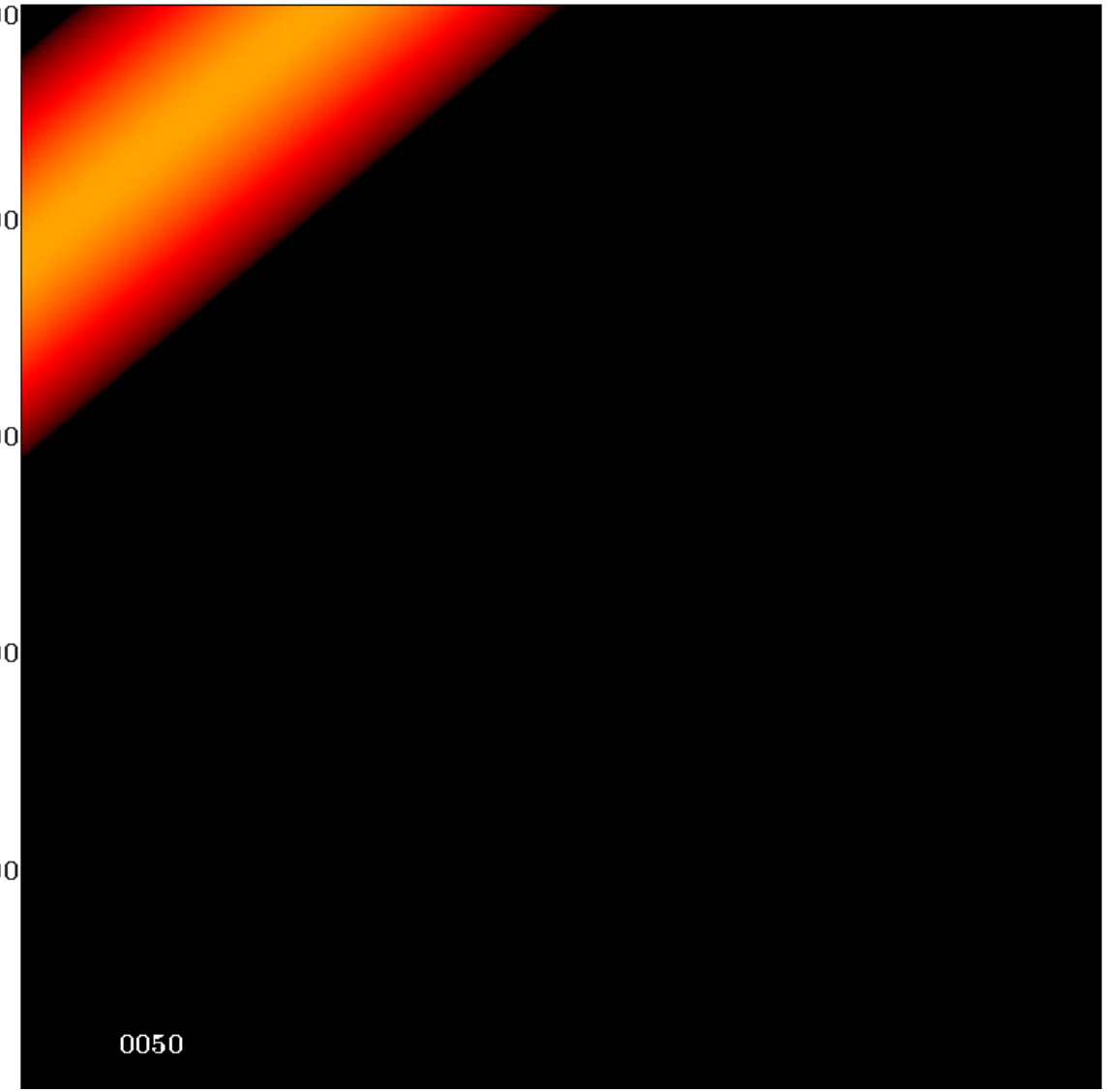
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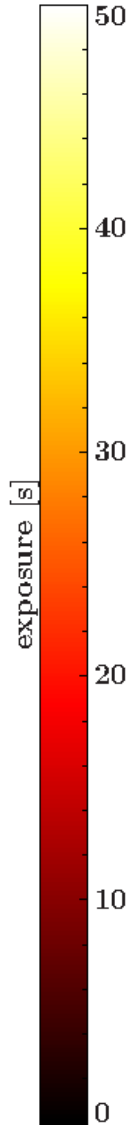
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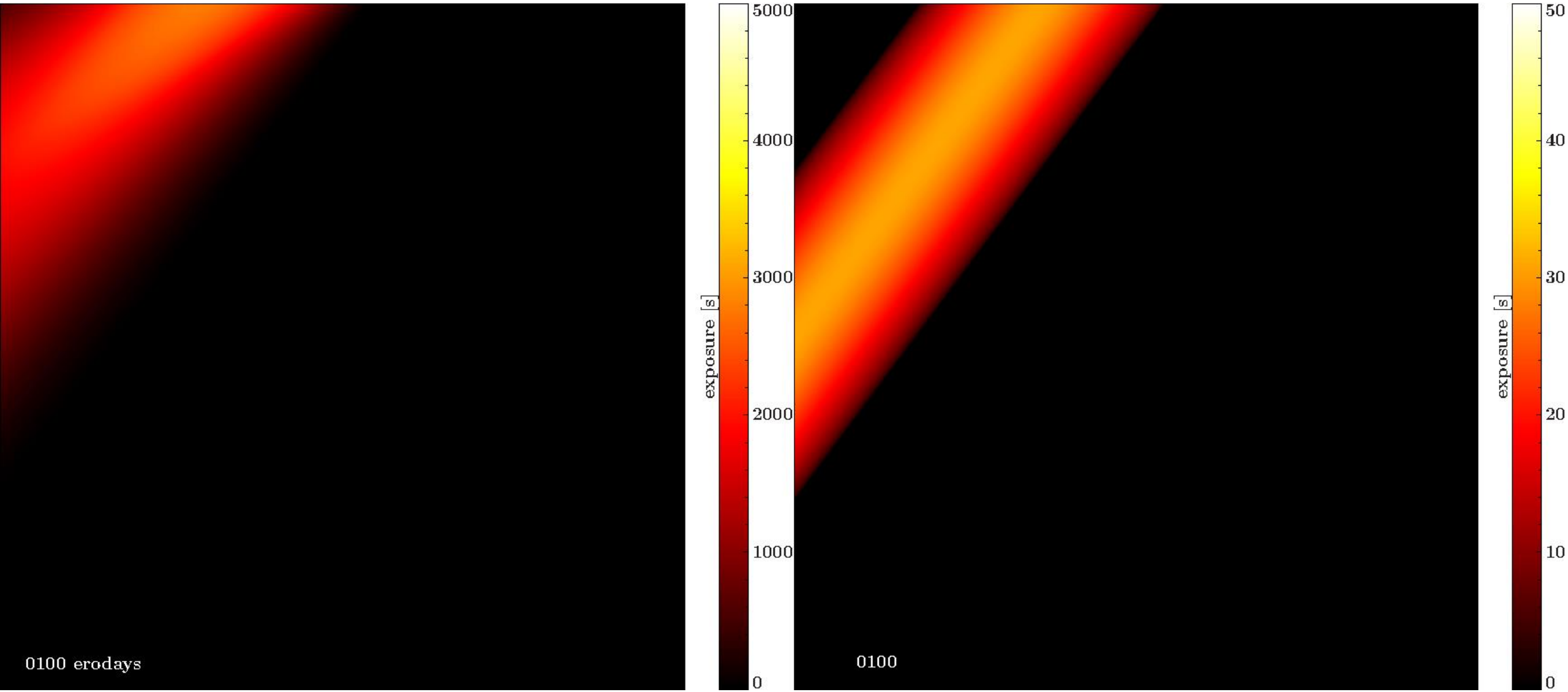
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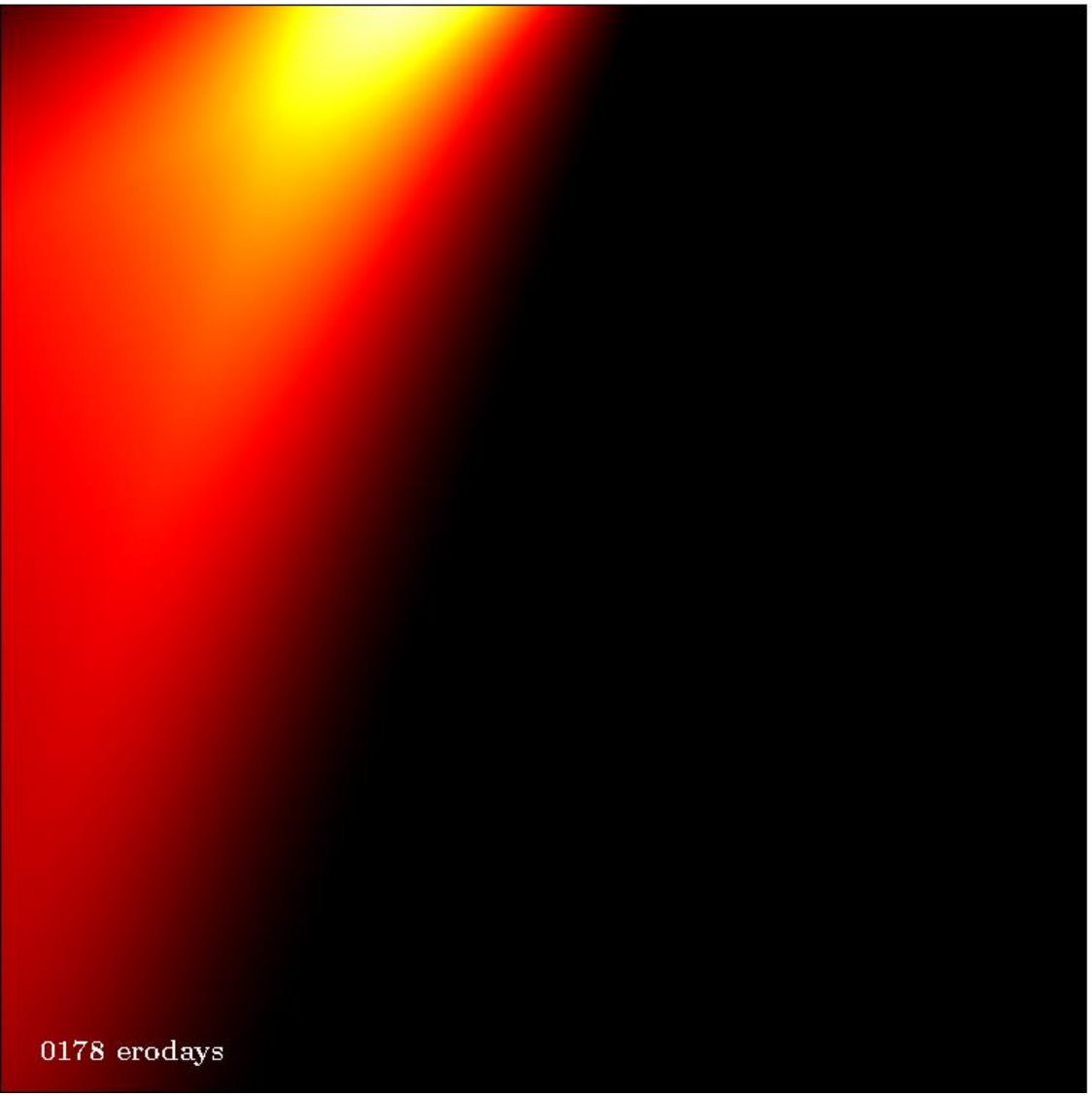
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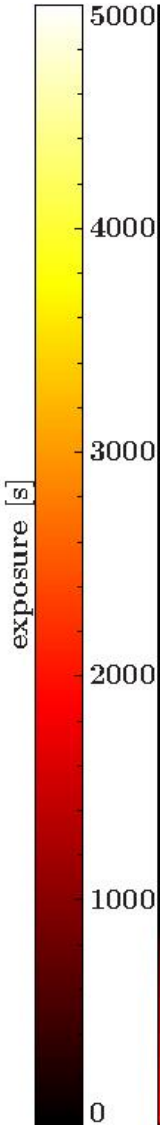
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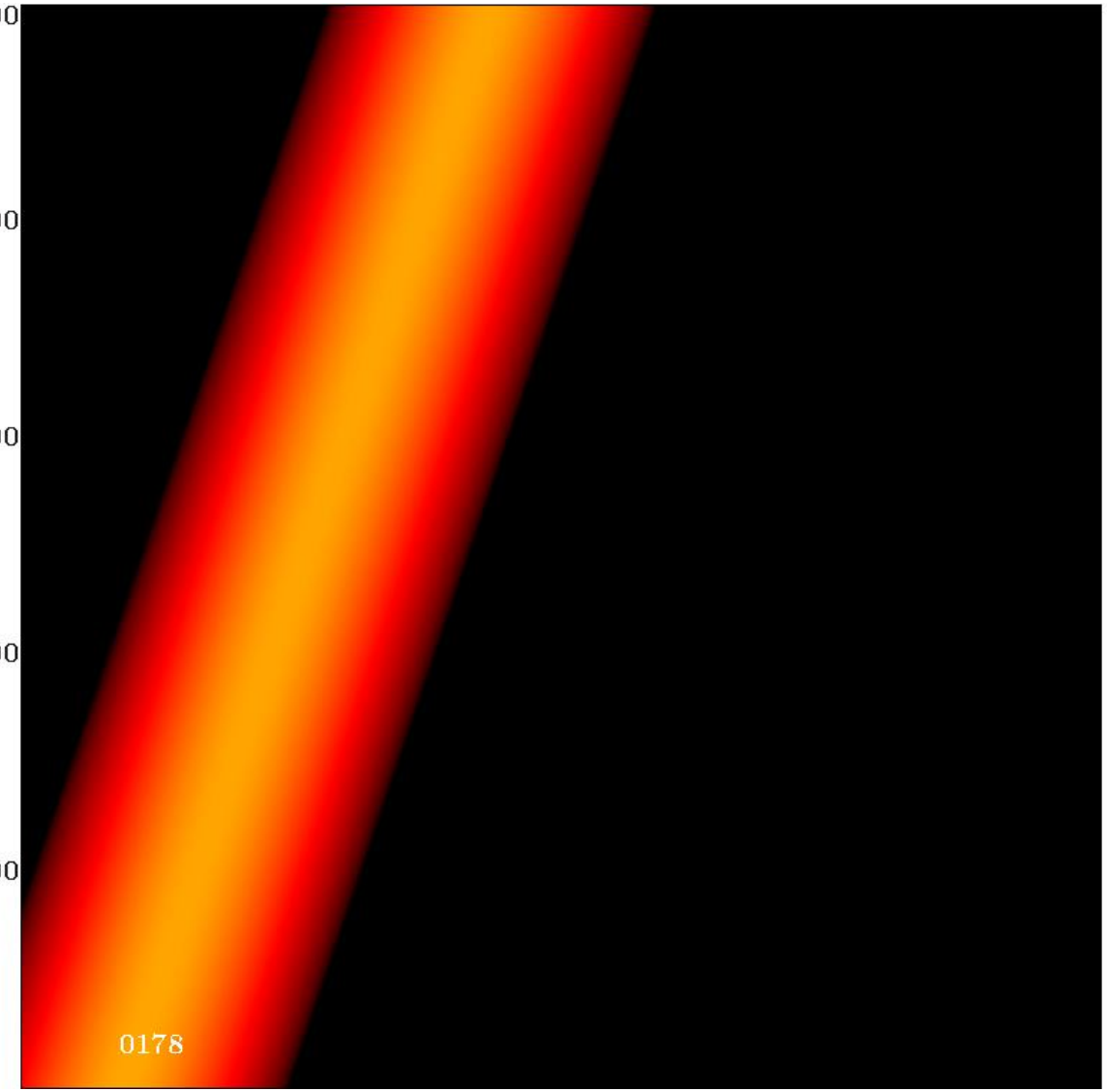
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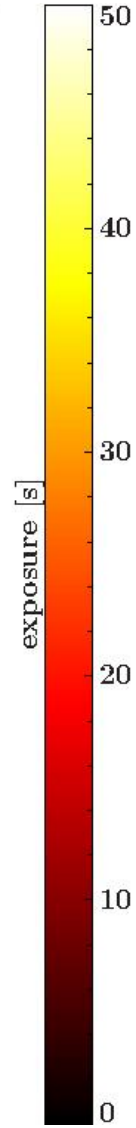
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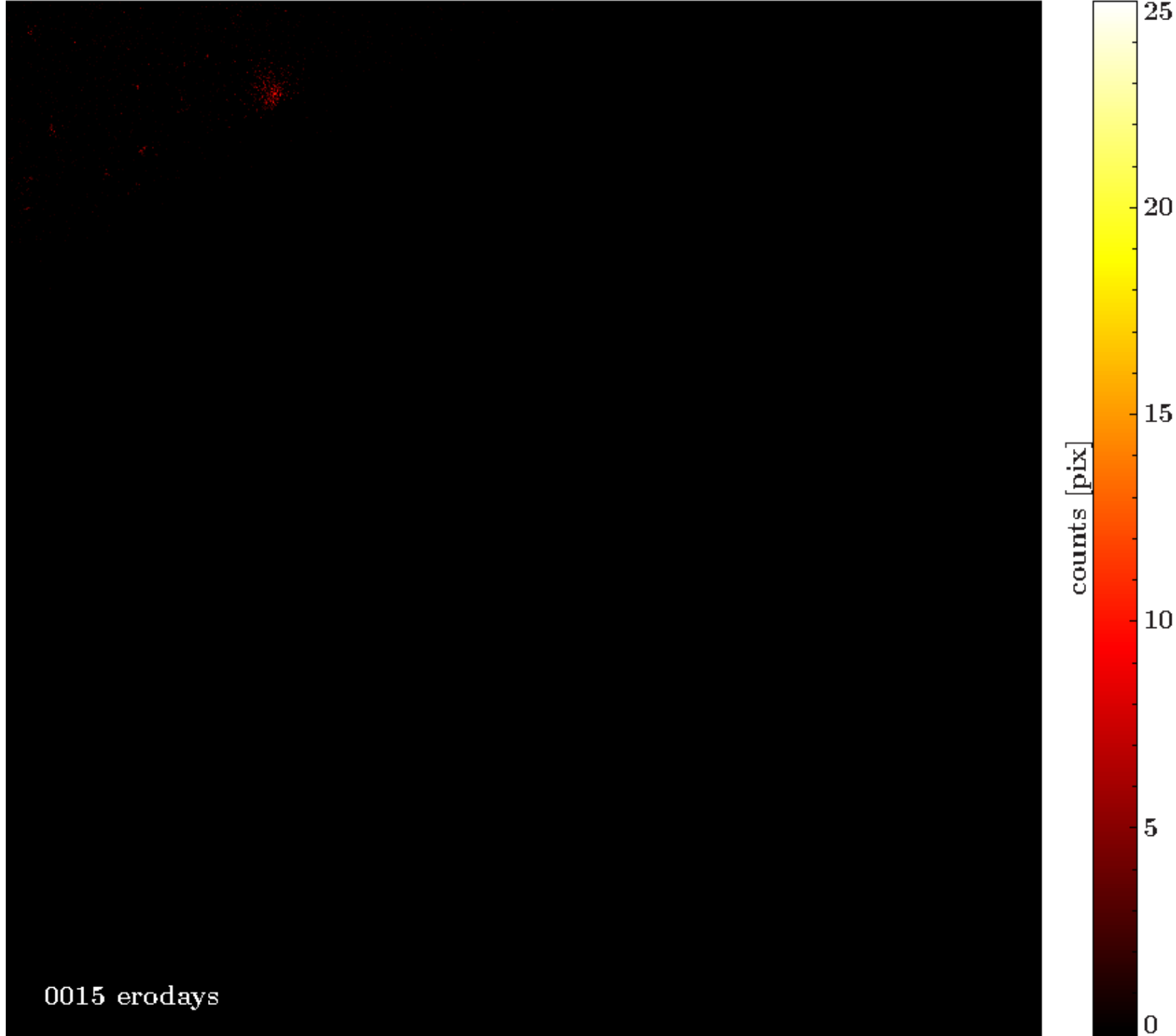
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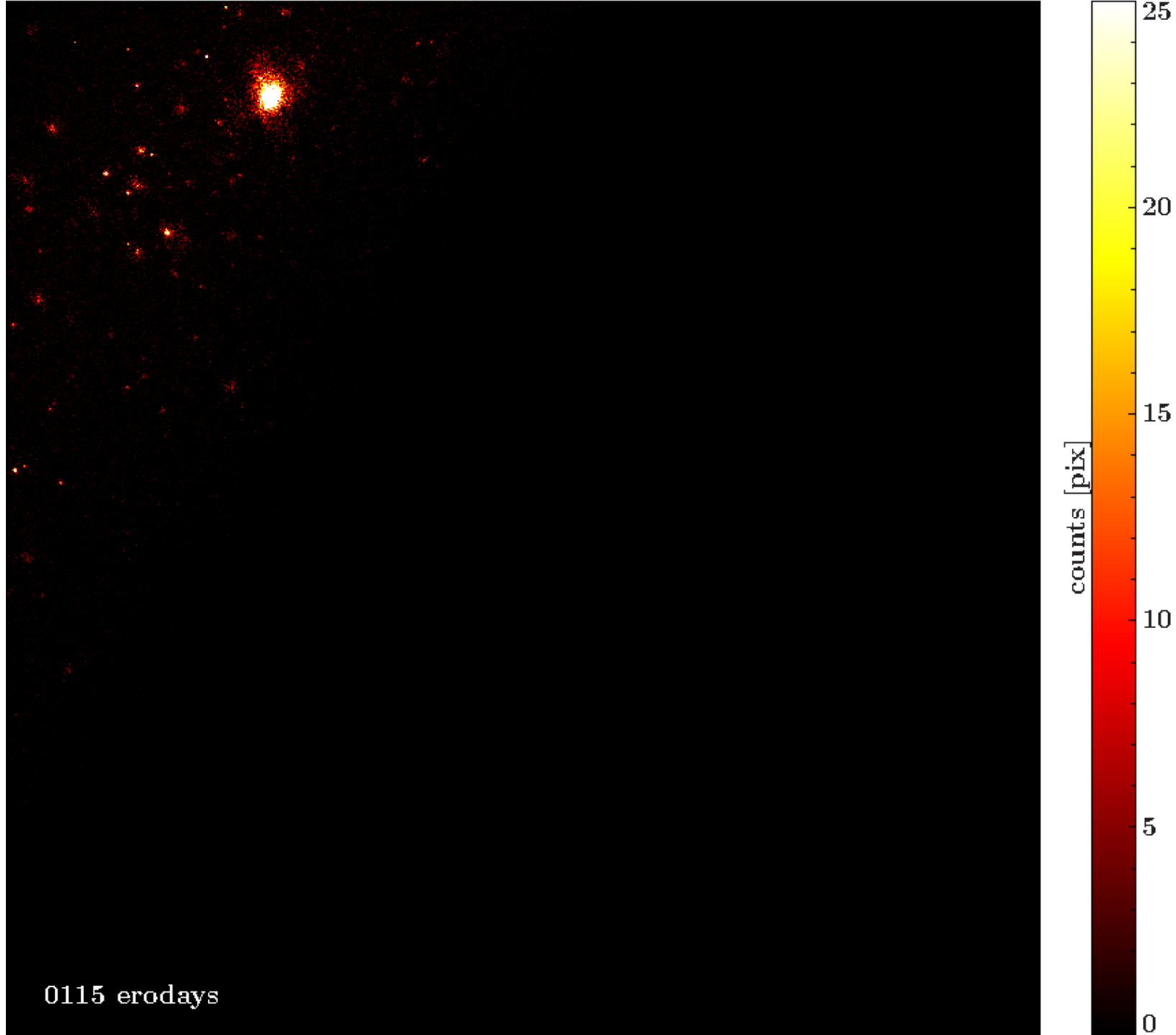
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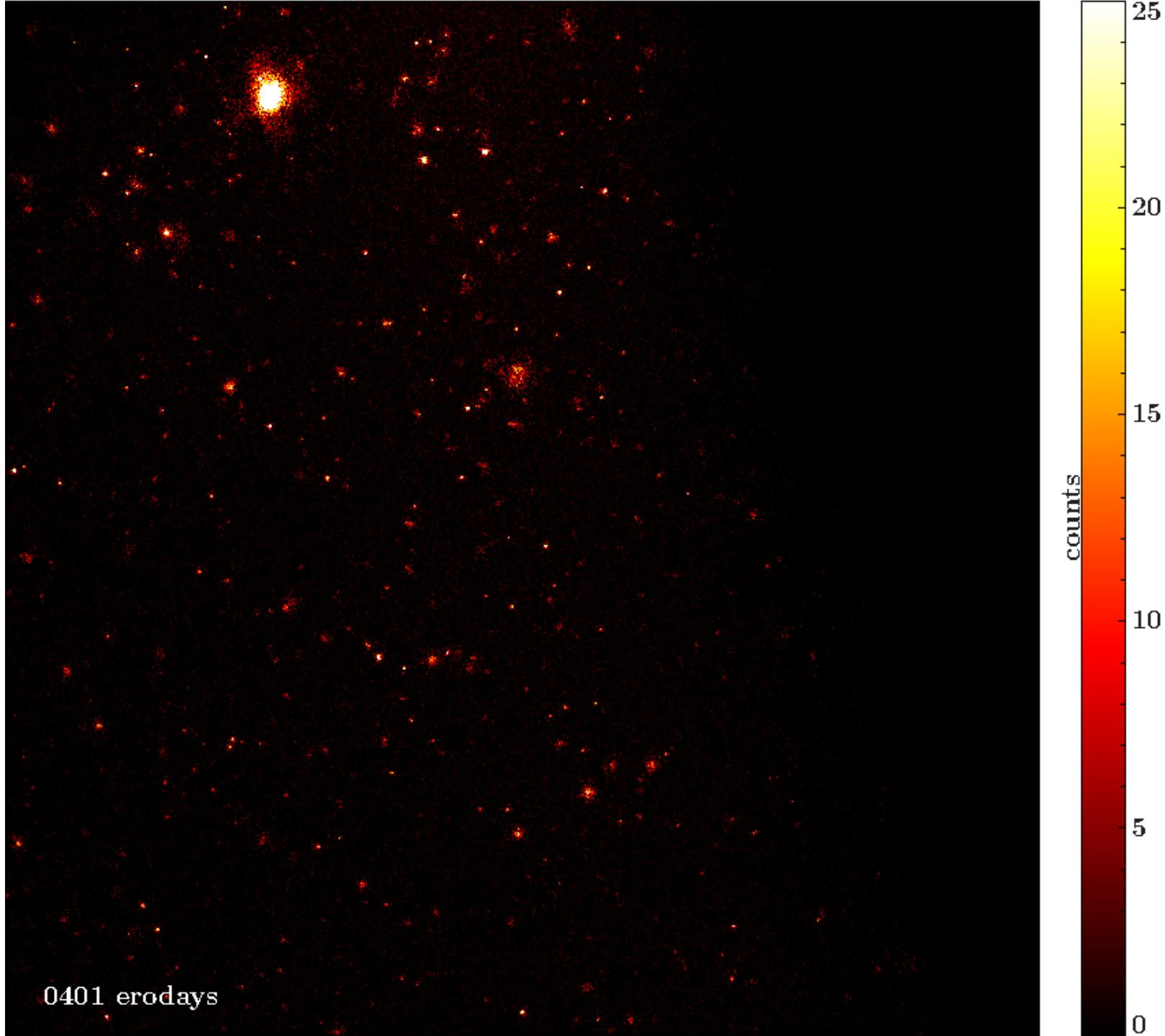
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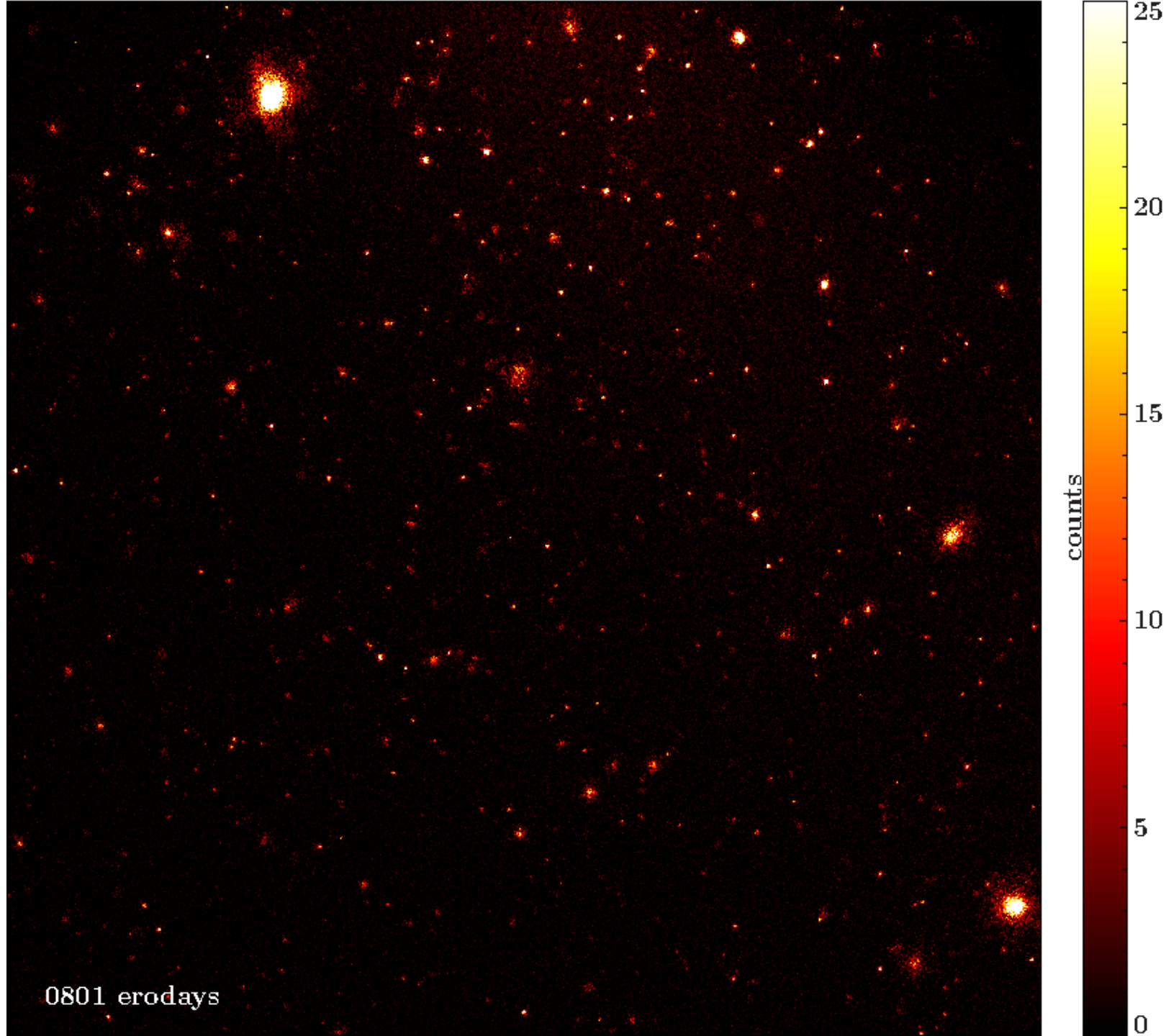
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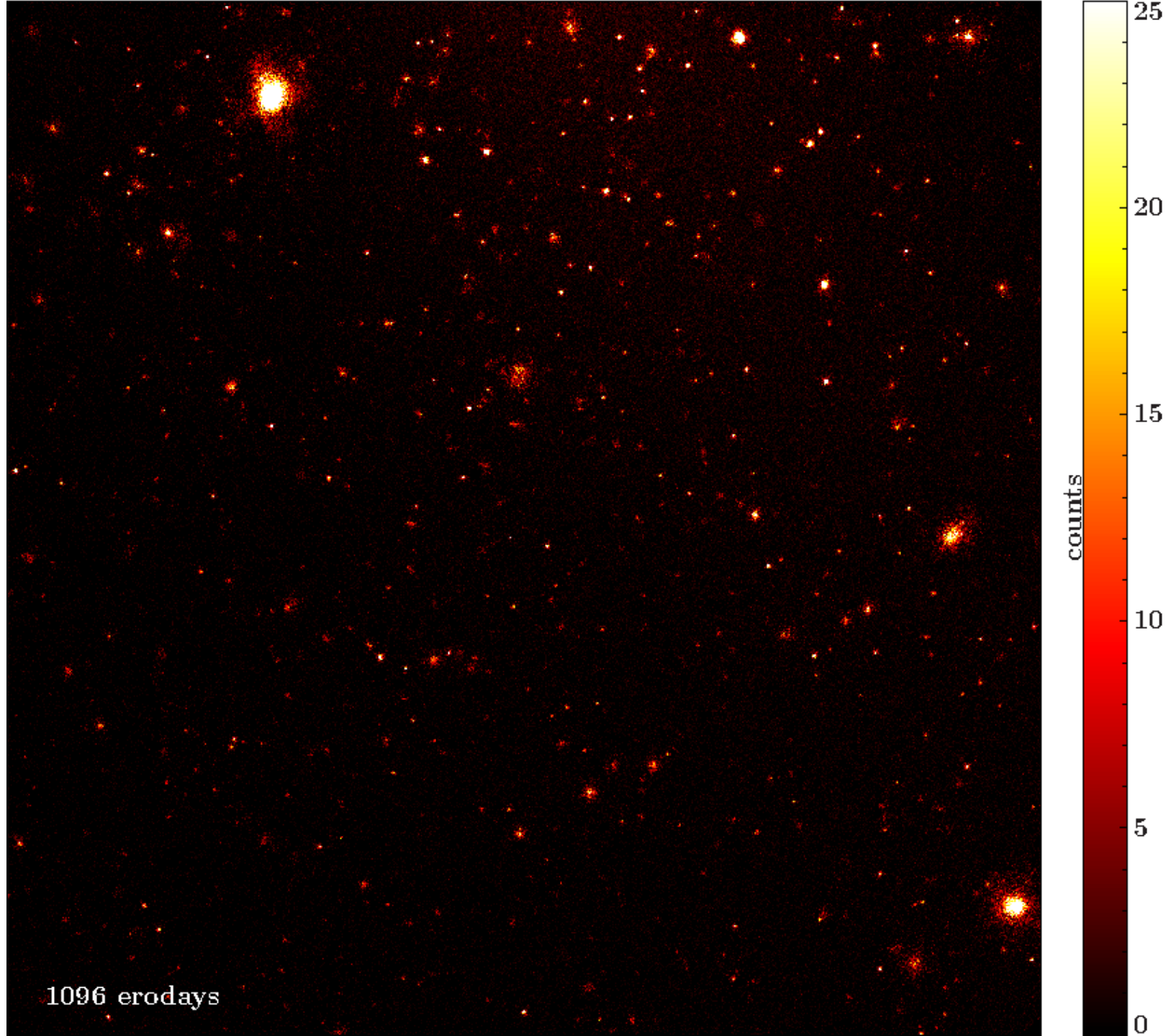
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