



coadd

12:37

12:36:58

12:36:56

12:36:54

12:36:52

12:36:50

12:36:48

12:36:46

-11:38:30

-11:39

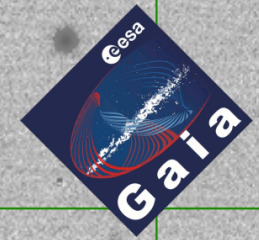
-11:39:30

-11:40

-11:40:30

1'

Powered by Aladin



Forum Gaia de l'Observatoire de Paris
16 septembre 2016

Gaia-GBOT et Gaia-DR1

“Ou quand Gaia observe Gaia”

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Satellite WMAP à La Silla
(Avril 2008 / T2.2m / WFI)



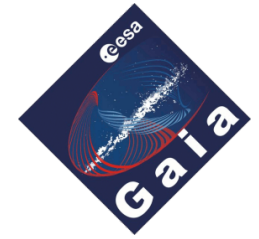
4.06' x 2.89'



Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Service d'observation :

Rattaché à l'OCA et à l'observatoire de Paris (*SO1*)

Composante du DPAC au sein du Core Unit 3 (*Dir. U. Biermann & M. Lattanzi*)

Motivation : Le suivi aux longueurs d'onde radio mis en place par l'ESA est insuffisant pour répondre aux exigences de la mission Gaia en terme d'exactitude d'orbite.

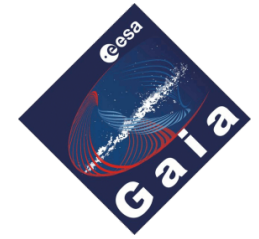
Rôle : Suivre la sonde Gaia à l'aide d'images CCD prises par un réseau de télescopes afin de fournir à l'ESA une position **quotidienne** de la sonde **durant toute la durée de la mission (2013-2019)**.



Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Service d'observation :

Rattaché à l'OCA et à l'observatoire de Paris (*SO1*)

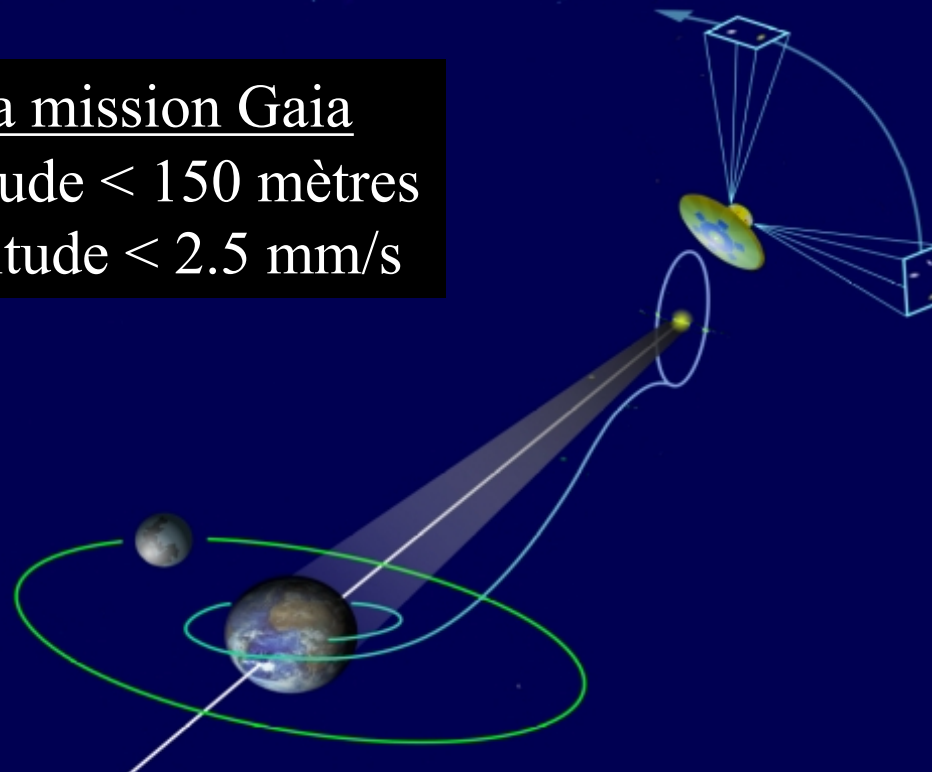
Composante du DPAC au sein du Core Unit 3 (*Dir. U. Biermann & M. Lattanzi*)

Motivation : Le suivi aux longueurs d'onde radio mis en place par l'ESA est insuffisant pour répondre aux exigences de la mission Gaia en terme d'exactitude d'orbite.

Rôle : Suivre la sonde Gaia à l'aide d'images CCD prises par un réseau de télescopes afin de fournir à l'ESA une position quotidienne de la sonde durant toute la durée de la mission (2013-2019).

Exigences de la mission Gaia

- Position incertitude < 150 mètres
- Vitesse incertitude < 2.5 mm/s



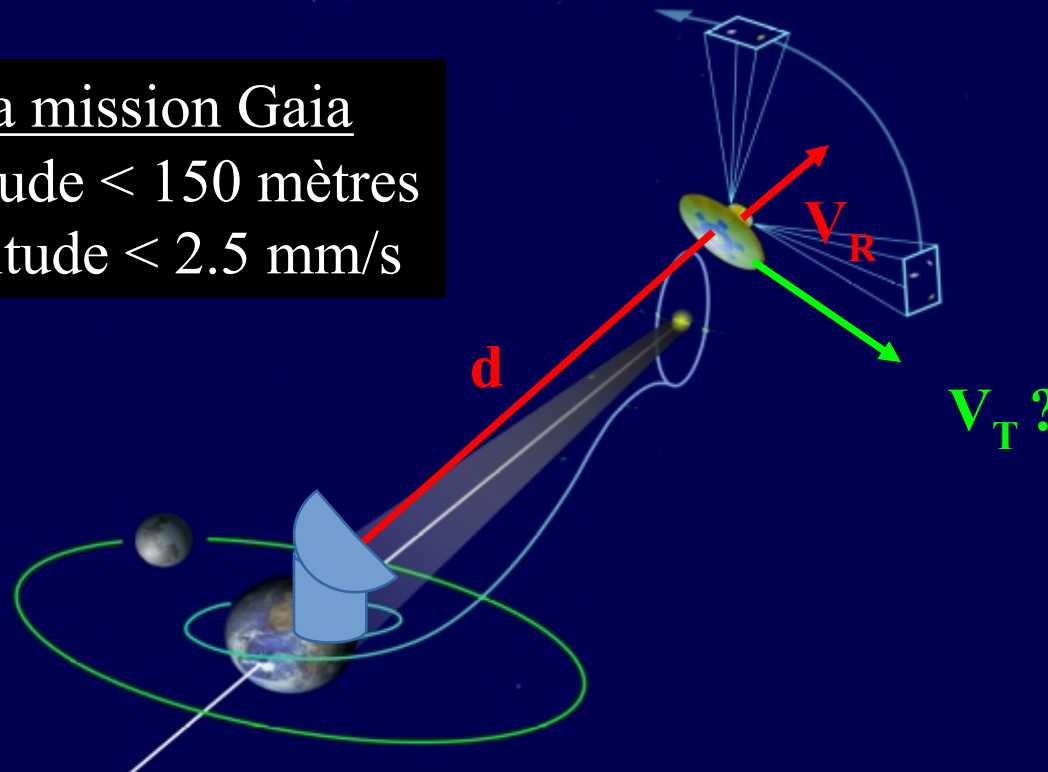
Astrométrie (aberration) $\rightarrow 7\mu\text{as}/10=0.7\mu\text{as}$

$\rightarrow V=3.10^8 \times 0.7\mu\text{as}=1\text{mm/s} \rightarrow 2.5\text{mm/s}$

Orbite astéroïdes (parallaxe) $\rightarrow 100\mu\text{as}$ à 2 UA $\rightarrow 150\text{m}$

Exigences de la mission Gaia

- Position incertitude < 150 mètres
- Vitesse incertitude < 2.5 mm/s



Méthodes traditionnelles de positionnement de satellite en L2 :

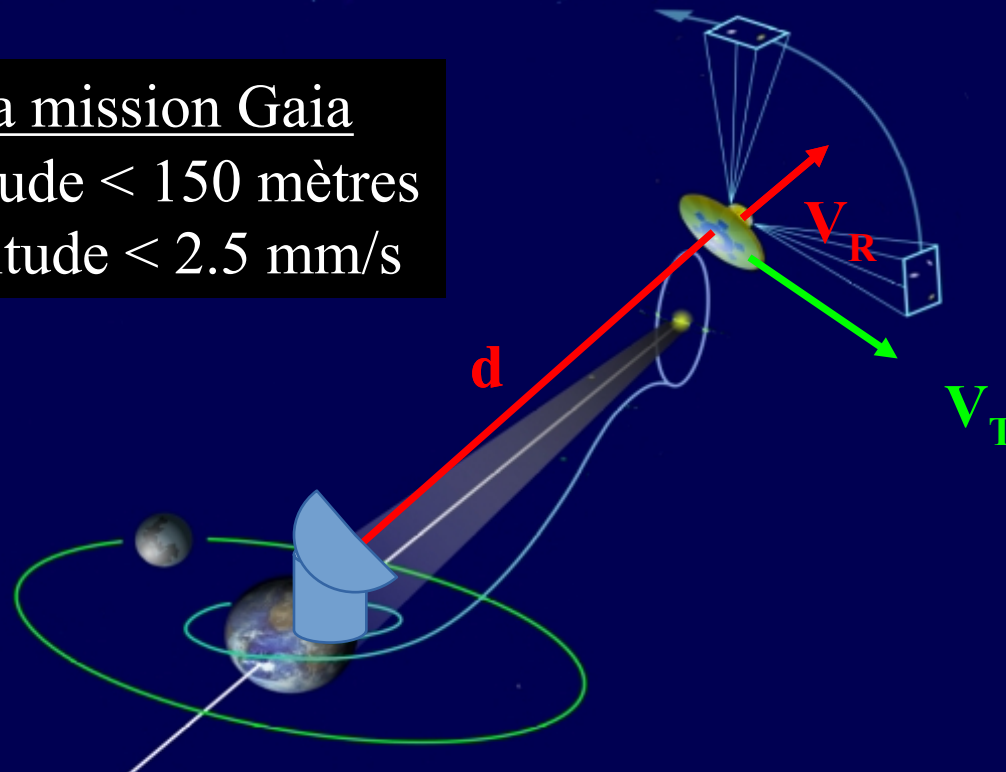
- Télémétrie Radio (range)
- Doppler Radio (range rate)

Limitations : 1) mesure uniquement radiale

2) précision insuffisante sur la journée (*pression de radiation solaire,..*)

Exigences de la mission Gaia

- Position incertitude < 150 mètres
- Vitesse incertitude < 2.5 mm/s



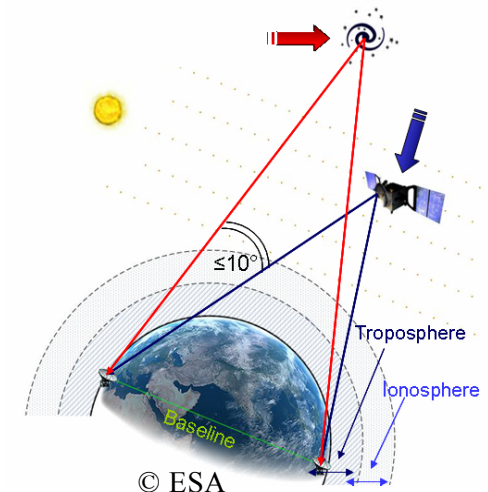
Méthodes traditionnelles de positionnement de satellite en L2 :

- Télémétrie Radio (Range)
- Doppler Radio (Range Rate)

Méthodes complémentaires (tangentes) :

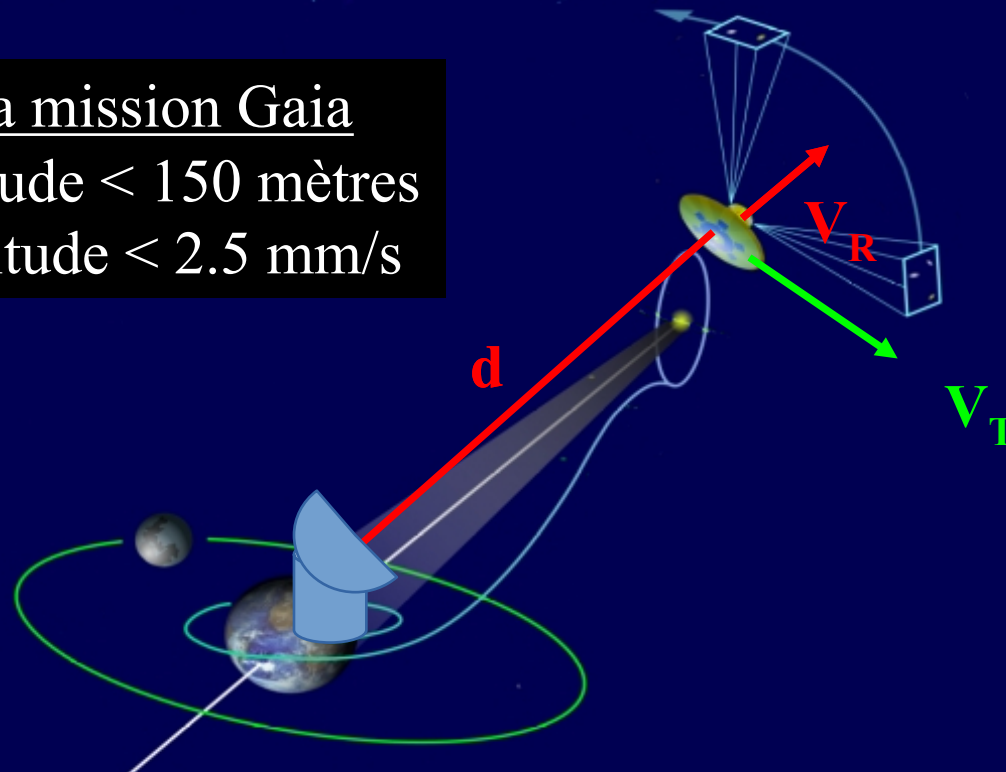
- Delta DOR (Differential One-way Range)

Limitations : Coût prohibitif



Exigences de la mission Gaia

- Position incertitude < 150 mètres
- Vitesse incertitude < 2.5 mm/s



Méthodes traditionnelles de positionnement de satellite en L2 :

- Télémétrie Radio (Range)
- Doppler Radio (Range Rate)

Méthodes complémentaires (tangentiels) :

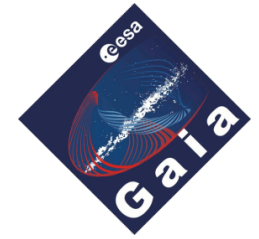
=> GBOT



Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Service d'observation :

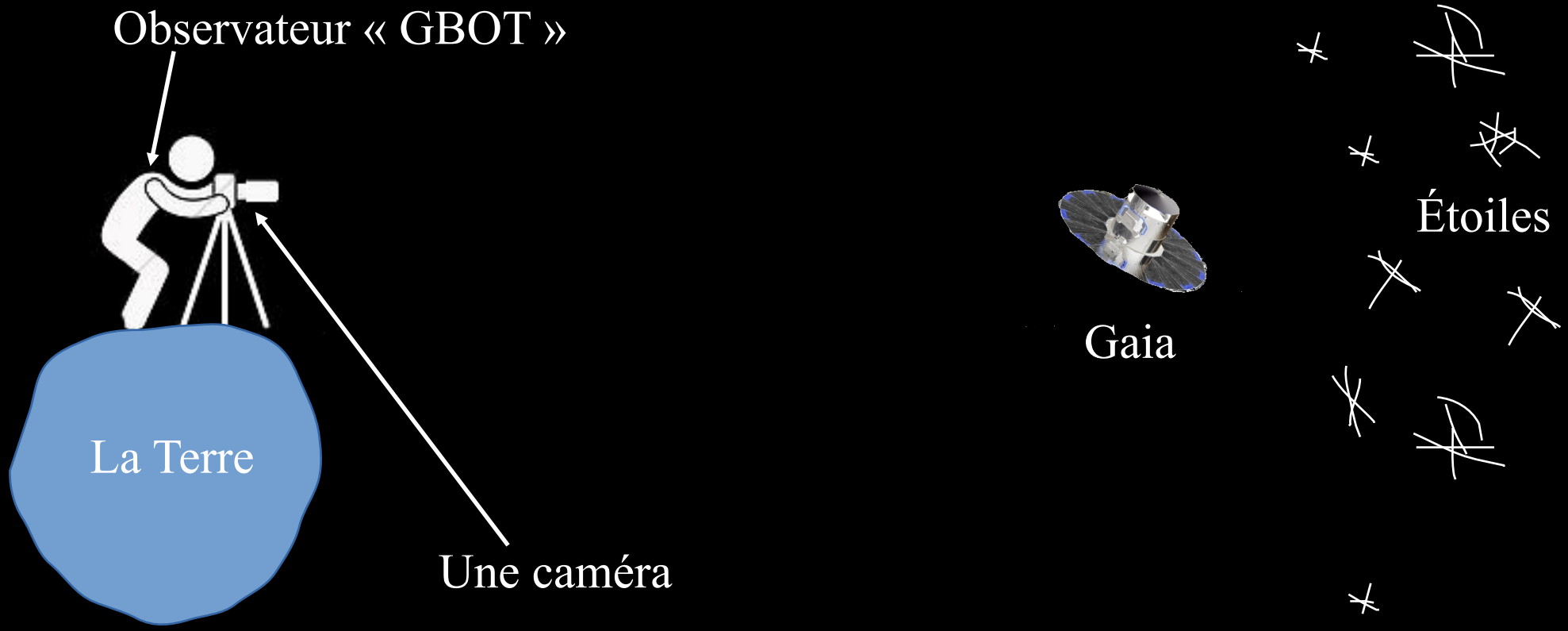
Rattaché à l'OCA et à l'observatoire de Paris (*SO1*)

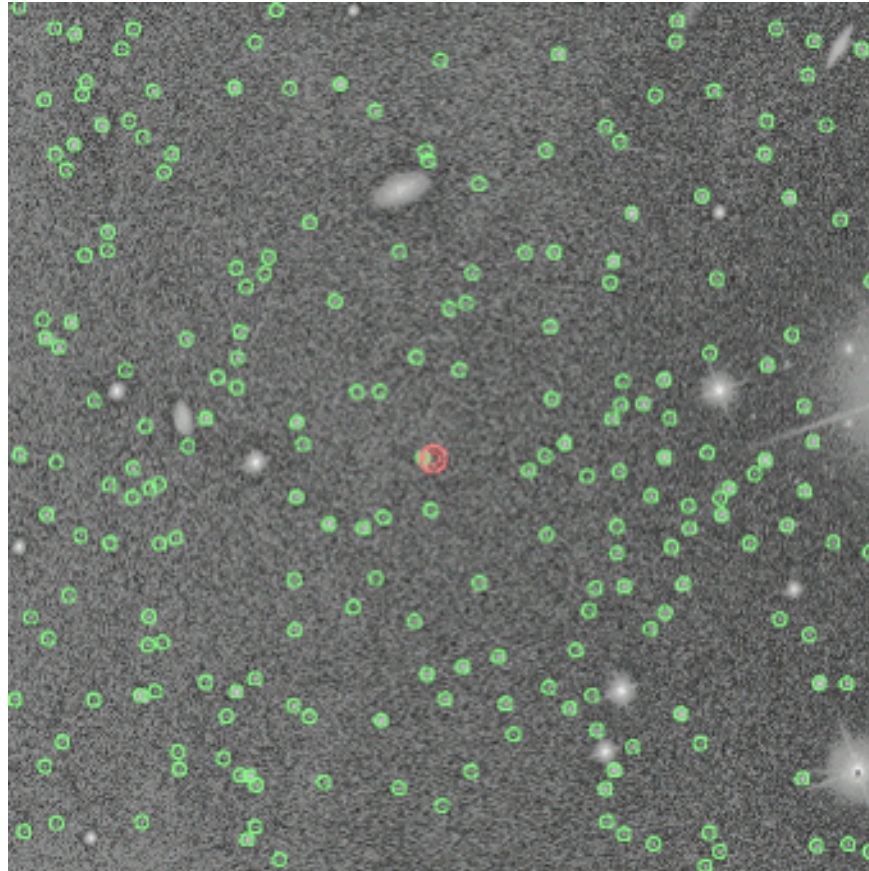
Composante du DPAC au sein du Core Unit 3 (*Dir. U. Biermann & M. Lattanzi*)

Motivation : Le suivi aux longueurs d'onde radio mis en place par l'ESA est insuffisant pour répondre aux exigences de la mission Gaia en terme d'exactitude d'orbite.

Rôle : **Suivre la sonde Gaia à l'aide d'images CCD prises par un réseau de télescopes afin de fournir à l'ESA une position quotidienne de la sonde durant toute la durée de la mission (2013-2019).**

Tous les jours, vers minuit (temps local)



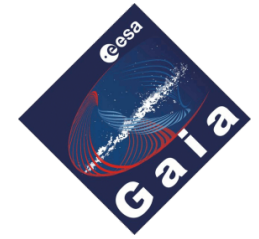


Mesures : Position Topocentrique Astrométrique
de la sonde Gaia avec une erreur dans l'ICRS < **20 mas**.

Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Responsabilités de l'Observatoire de Paris (SyRTE) :

- 1 - Fournir l'éphéméride et les cartes de champ de la sonde aux Observatoires.
- 2 - Récupérer, archiver et distribuer les observations et les résultats des réductions.
(*Res. C. Barache & T. Carlucci*)
- 3 - Développer les logiciels semi-automatique de réduction astrométrique d'images CCD.
(*Resp. S. Bouquillon & F. Taris*)
- 4 - Délivrer les résultats à l'ESA chaque mois.
- 5 - Retraiter l'ensemble des images avec le catalogue Gaia

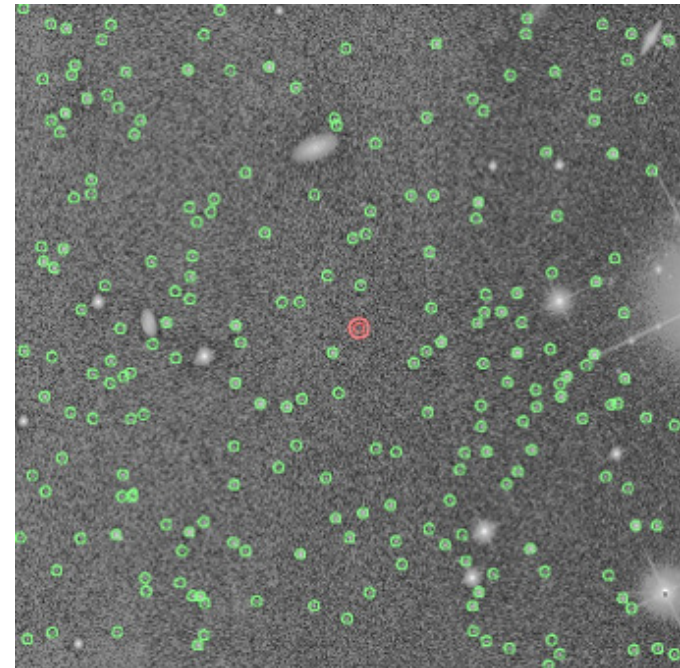
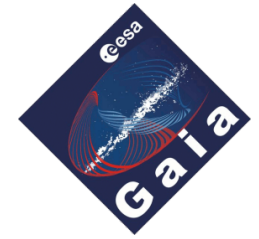


Image du satellite Gaia prise par le LT le 21/08/2015

Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Responsabilités de l'Observatoire de Paris (SyRTE) :

1 - Fournir l'éphéméride et les cartes de champ de la sonde aux Observatoires.

2 - Récupérer

Contraintes Opérationnelles : Tous les jours une personne d'astreinte pour GBOT (même les week-ends !)

3 - Développer les logiciels semi-automatique de réduction astrométrique d'images CCD.

(Resp. F. Taris & S. Bouquillon)

4 - Délivrer les résultats à l'ESA chaque mois.

5 - Retraiter l'ensemble des images avec le catalogue Gaia

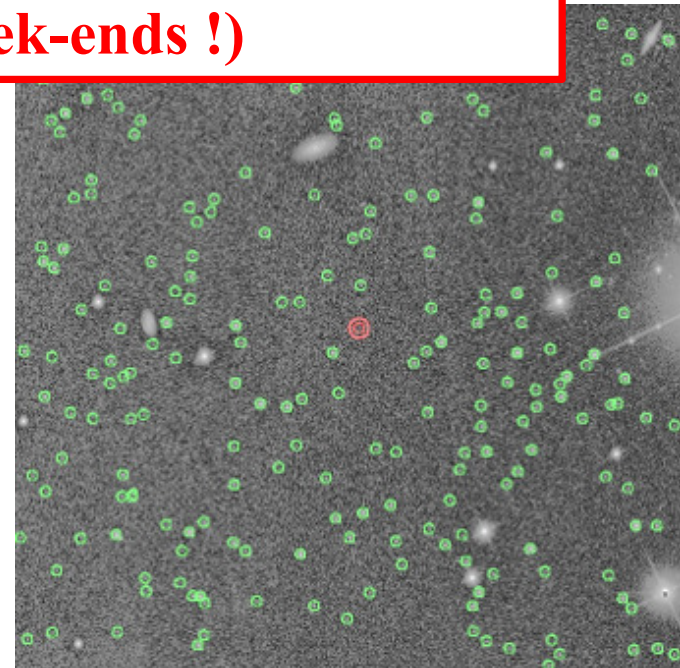


Image du satellite Gaia prise par le LT le 21/08/2015

Responsabilités de l'Observatoire de Paris (SyRTE) :

- 1 - Fournir l'éphéméride et les cartes de champ de la sonde aux Observatoires.**
- 2 - Récupérer, archiver et distribuer les observations et les résultats des réductions.
(Res. T. Carlucci & C. Barache)
- 3 - Développer les logiciels semi-automatique de réduction astrométrique d'images CCD.
(Resp. F. Taris & S. Bouquillon)
- 4 - Délivrer les résultats à l'ESA chaque mois.
- 5 - Retraiter l'ensemble des images avec le catalogue Gaia

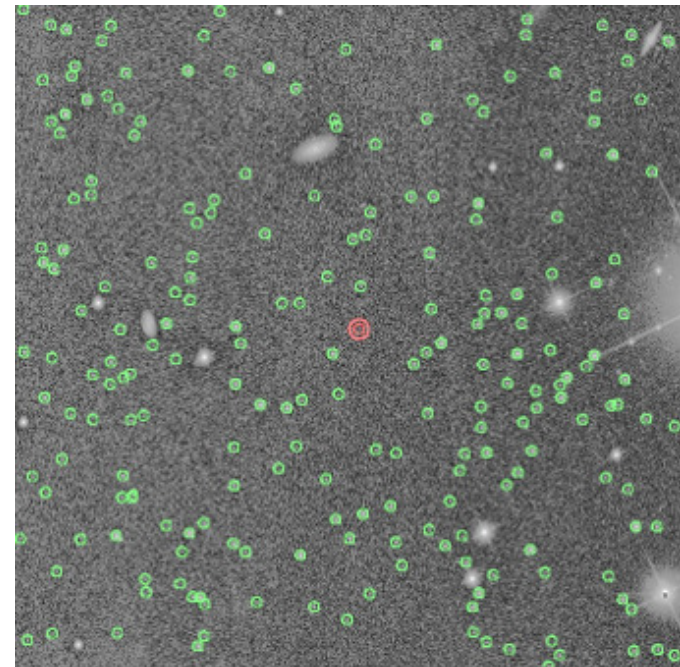
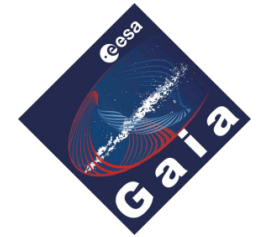


Image du satellite Gaia prise par le LT le 21/08/2015

Gaia-GBOT


Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



GBOT FoV Maker - Mozilla Firefox

gbot.obspm.fr/index.php?page=FOV&sous_menu=operational



Presentation FoV Maker GBOT Pipeline GBOT DataBase GBOT asteroids Team

GBOT Interactive Tools for Satellites & Asteroids Observations

Field of View Maker

Night :

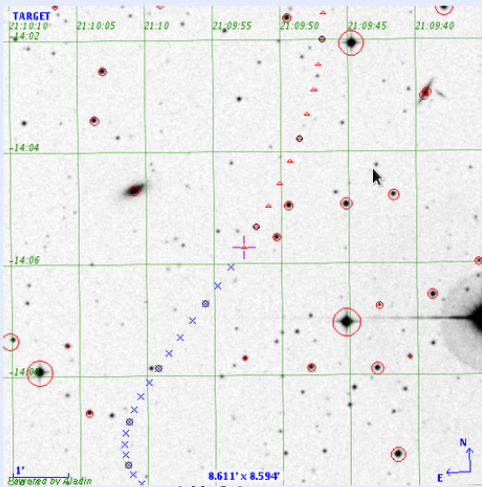
Telescope :

Target :

PAF OFFSET : R.A. (")

PAF OFFSET : DEC. (")

Field of View :



Field of View center : 21:09:52.79hms -14:05:42.2dms (GAIA the 2015-Aug-22 at 00:45(UT)) ;
Legend of symbols in the chart

Ephemeris :

Telescope : Liverpool Telescope
Date : Night between 2015-Aug-21 and 2015-Aug-22

GAIA Ephemeris :

#	Date	Time(UTC)	RA deg	DEC deg	RA_hms	DEC_dms	RA_Speed(mas/s)
2015-Aug-21	18:15	317.441380	-14.185793	21:09:45.93	-14:11:08.8	32.723093	
2015-Aug-21	18:30	317.451814	-14.186687	21:09:48.43	-14:11:01.2	39.851868	
2015-Aug-21	18:45	317.461306	-14.181572	21:09:50.71	-14:10:53.6	36.089212	
2015-Aug-21	19:00	317.469859	-14.179432	21:09:52.76	-14:10:45.9	32.347215	
2015-Aug-21	19:15	317.477480	-14.177254	21:09:54.59	-14:10:38.1	28.642159	
2015-Aug-21	19:30	317.484180	-14.175023	21:09:55.20	-14:10:30.0	24.990116	
2015-Aug-21	19:45	317.489975	-14.172724	21:09:57.59	-14:10:21.8	21.406910	
2015-Aug-21	20:00	317.494884	-14.170344	21:09:58.77	-14:10:13.2	17.908179	
2015-Aug-21	20:15	317.498929	-14.167870	21:09:59.74	-14:10:04.3	14.509111	
2015-Aug-21	20:30	317.502138	-14.165288	21:10:00.51	-14:09:55.0	11.224682	
2015-Aug-21	20:45	317.504541	-14.162585	21:10:01.08	-14:09:45.3	8.069394	
2015-Aug-21	21:00	317.506173	-14.159749	21:10:01.48	-14:09:35.0	5.056962	
2015-Aug-21	21:15	317.507070	-14.156769	21:10:01.69	-14:09:24.3	2.200684	
2015-Aug-21	21:30	317.507273	-14.153633	21:10:01.74	-14:09:13.0	-0.486635	
2015-Aug-21	21:45	317.506827	-14.150331	21:10:01.63	-14:09:01.1	-2.993251	
2015-Aug-21	22:00	317.505777	-14.146854	21:10:01.38	-14:08:48.6	-5.307938	
2015-Aug-21	22:15	317.504173	-14.143192	21:10:01.00	-14:08:35.4	-7.420388	
2015-Aug-21	22:30	317.502066	-14.139397	21:10:00.49	-14:08:21.6	-9.321173	
2015-Aug-21	22:45	317.499512	-14.135282	21:09:59.88	-14:08:07.0	-11.001881	
2015-Aug-21	23:00	317.496565	-14.131021	21:09:59.17	-14:07:51.6	-12.454611	
2015-Aug-21	23:15	317.493285	-14.126548	21:09:58.38	-14:07:35.5	-13.673528	
2015-Aug-21	23:30	317.489729	-14.121859	21:09:57.53	-14:07:18.6	-14.652720	





Download Ephemeris: [GBOT](#) or [PAF](#) Format ([obx file \(V1\)](#) [obx file \(V2\)](#))

Date for ephemeris download : 2016-01-05T11:31:58
Moon Angular Distance : 86.69(deg)
Minimal Zenith Distance : 43.15(deg) at 00:45(UTC) (where Speed = 28.48 (mas/s))
Minimum Tangential Speed : 12.43(mas/s) at 21:15(UTC) (where Z.Distance = 62.42 (deg))

Remarks :

* Ephemerides are provided by The ESA's Flight Dynamic Center.
* FOV maker use some Virtual Observatory Tools : [Stilts](#), [Aladin](#), [ESO online digitized Sky Survey](#), [CDSclient](#).

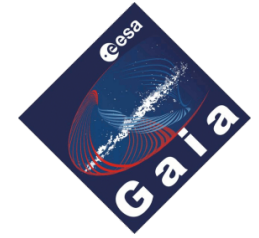
Developed by : S. Bouquillon & T. Carlucci

Gaia-GBOT


Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



GBOT FoV Maker - Mozilla Firefox

GBOT FoV Maker
Yahoo



Data Storage and Processing Center of Gaia-GBOT

[Presentation](#)
[FoV Maker](#)
[GBOT Pipeline](#)
[GBOT DataBase](#)
[GBOT asteroids](#)
[Team](#)

GBOT Interactive Tools for Satellites & Asteroids Observations

Field of View Maker

Night :

Telescope :

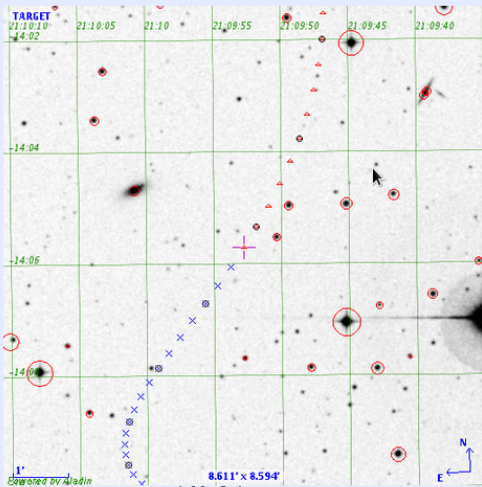
Target :

PAF OFFSET : R.A. (")

PAF OFFSET : DEC. (")

[Generate FOV](#)

Field Of View :



Field of View center :
 21:09:52.79hms -14:05:42.2dms (GAIA the 2015-Aug-22 at 00:45(UT));

[Legend of symbols in the chart](#)

Ephemeris :

Telescope : Liverpool Telescope
Date : Night between 2015-Aug-21 and 2015-Aug-22

GAIA Ephemeris :

#	Date	Time(UTC)	RA deg	DEC deg	RA_hms	DEC_dms	RA_Speed(mas/s)
2015-Aug-21	18:15		317.441380	-14.185793	21:09:45.93	-14:11:08.8	32.723093
2015-Aug-21	18:30						
2015-Aug-21	18:45						
2015-Aug-21	19:00						
2015-Aug-21	19:15						
2015-Aug-21	19:30						
2015-Aug-21	19:45						
2015-Aug-21	20:00						
2015-Aug-21	20:15						
2015-Aug-21	20:30						
2015-Aug-21	20:45						
2015-Aug-21	21:00						
2015-Aug-21	21:15						
2015-Aug-21	21:30						
2015-Aug-21	21:45						
2015-Aug-21	22:00						
2015-Aug-21	22:15						
2015-Aug-21	22:30						
2015-Aug-21	22:45						
2015-Aug-21	23:00						
2015-Aug-21	23:15						
2015-Aug-21	23:30						
2015-Aug-21	23:45						


Download Ephemeris file (V2)


Date for ephemeris
Moon Angular Dist.
Minimal Zenith Dis.
Minimum Tangenti


Remarks :


- * Ephemerides are pr
- * FOV maker use som
- CDScienc.


Developed by : S. Bou







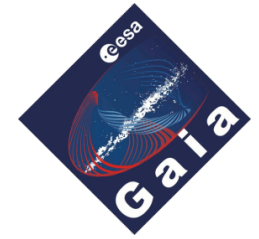




Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Les télescopes engagés dans GBOT :

- **Le Liverpool Telescope (La Palma, 2.0m)**
- Le Réseau LCOGT (Sutherland, 3 x 1.0m / Cerro Tololo, 2 x 1.0m / McDonal Obs. 1.0m)
- Le Pic du Midi (Pic du Midi de Bigorre, 1.0m)

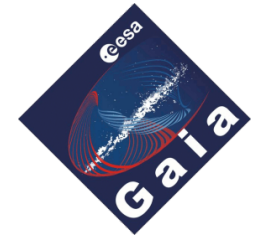


Le Liverpool Telescope (La Palma, 2.0m)

Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Les télescopes engagés dans GBOT :

- **Le Liverpool Telescope (La Palma, 2.0m)**
- Le Réseau LCOGT (Sutherland, 3 x 1.0m / Cerro Tololo, 2 x 1.0m / McDonal Obs. 1.0m)
- Le Pic du Midi (Pic du Midi de Bigorre, 1.0m)

Jusqu'au 20 Décembre 2013

Mag. de Gaia en $L_2 \sim 18$



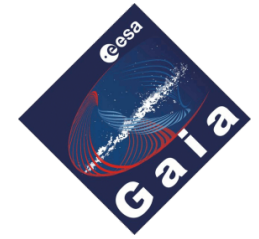
Le Liverpool Telescope (La Palma, 2.0m)

La mauvaise surprise ...

Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Les télescopes engagés dans GBOT :

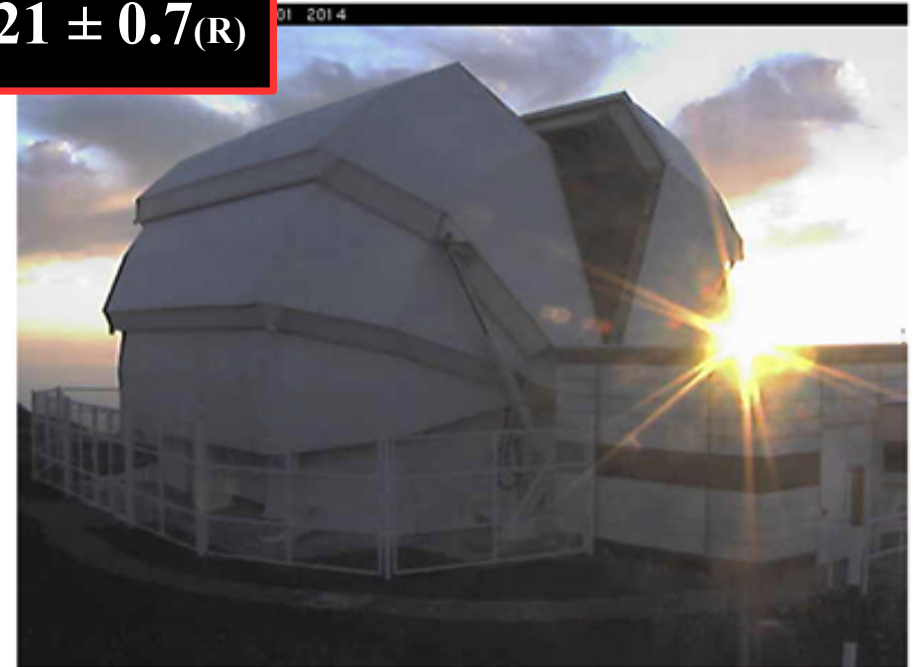
- **Le Liverpool Telescope (La Palma, 2.0m)**
- Le Réseau LCOGT (Sutherland, 3 x 1.0m / Cerro Tololo, 2 x 1.0m / McDonal Obs. 1.0m)
- Le Pic du Midi (Pic du Midi de Bigorre, 1.0m)

Jusqu'au 20 Décembre 2013

Mag. de Gaia en $L_2 \sim 18$

A Partir du 21 Décembre 2013

Mag. de Gaia en $L_2 \sim 21 \pm 0.7(R)$

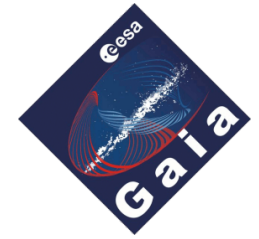


Le Liverpool Telescope (La Palma, 2.0m)

Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Les télescopes engagés dans GBOT :

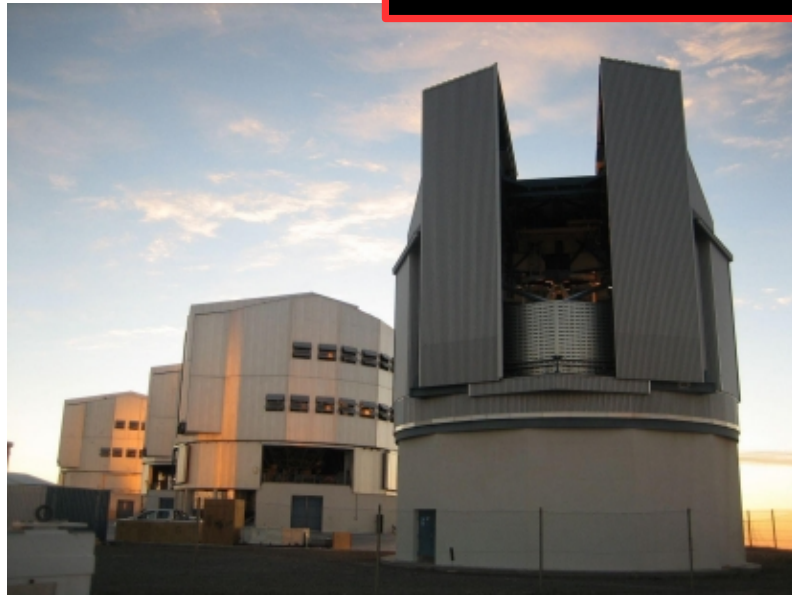
- **Le Liverpool Telescope (La Palma, 2.0m)**
- Le Réseau LCOGT (Sutherland, 3 x 1.0m / Cerro Tololo, 2 x 1.0m / McDonal Obs. 1.0m)
- Le Pic du Midi (Pic du Midi de Bigorre, 1.0m)
- **VLT Survey Telescope (Parranal, 2.6m)**

Jusqu'au 20 Décembre 2013

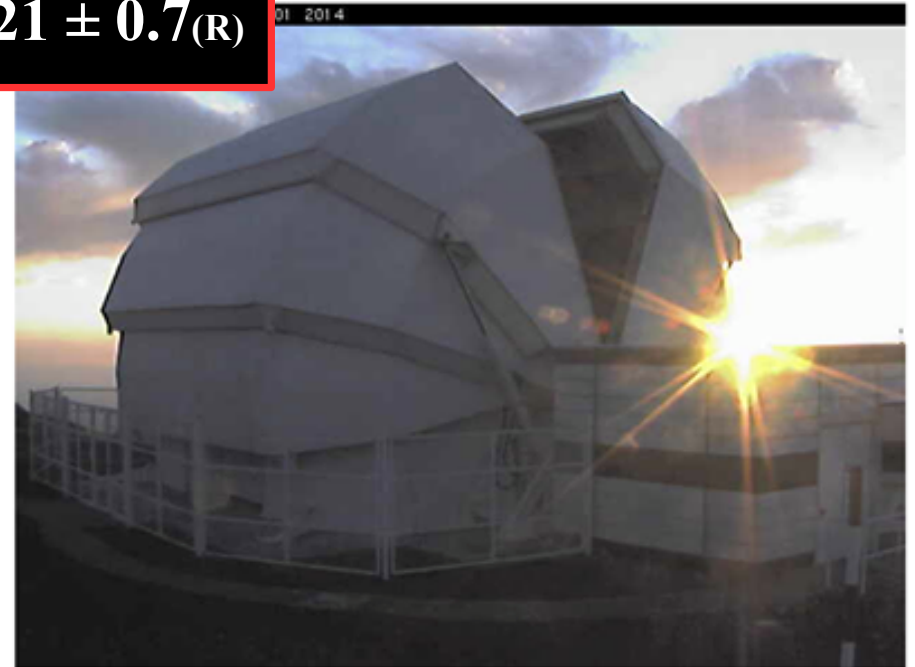
Mag. de Gaia en $L_2 \sim 18$

A Partir du 21 Décembre 2013

Mag. de Gaia en $L_2 \sim 21 \pm 0.7(R)$



VLT Survey Telescope (Parranal, 2.6m)



Le Liverpool Telescope (La Palma, 2.0m)

La bonne surprise ...

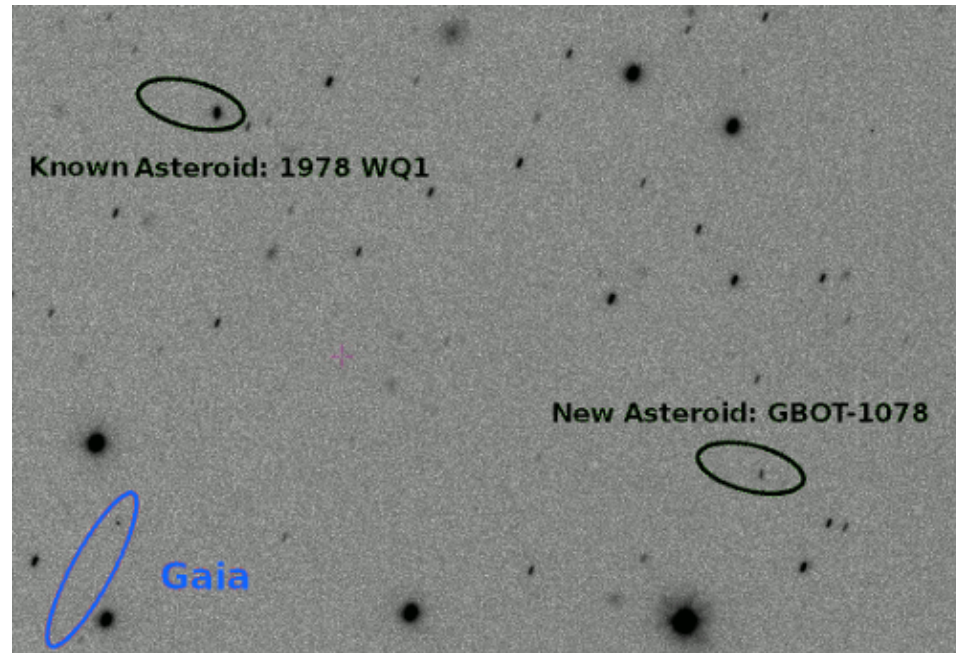
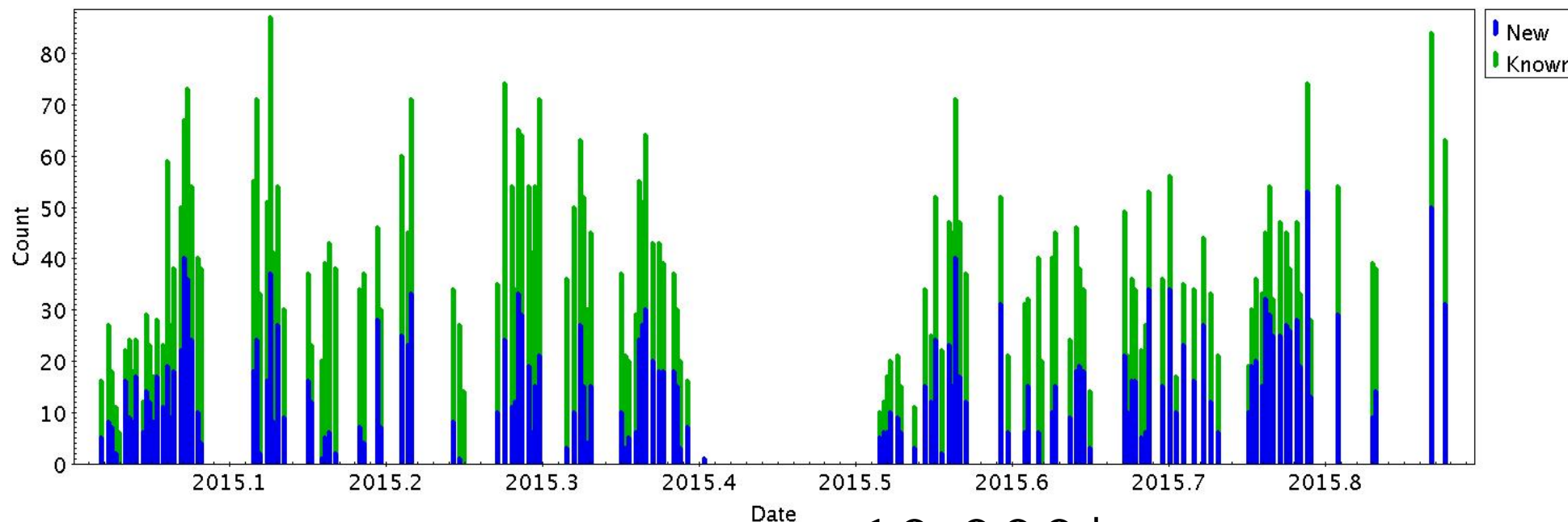


Image VST (ESO CCD #84) le 20 avril 2015

Les observations d'astéroïdes par GBOT

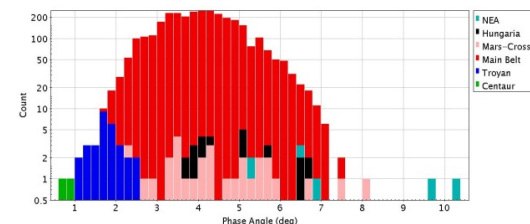


Nombre d'astéroïdes observés par GBOT: **10 000⁺** (au 12 septembre 2016)

Astéroïdes connus : 5199

Astéroïdes inconnus : 4521

Détermination de la magnitude absolue (H)



- Délai Obs/Red. < 24h
- Gaia Fun SSO (*W. Thuillot & B. Carry*)
- + VST observations (*A. Cellino*)

Responsabilités de l'Observatoire de Paris (SyRTE) :

1 - Fournir l'éphéméride et les cartes de champ de la sonde aux Observatoires.

2 - **Récupérer, archiver et distribuer les observations et les résultats des réductions.**

(Res. C. Barache & T. Carlucci)

3 - Développer les logiciels semi-automatique de réduction astrométrique d'images CCD.

(Resp. S. Bouquillon & F. Taris)

4 - Délivrer les résultats à l'ESA chaque mois.

5 - Retraiter l'ensemble des images avec le catalogue Gaia

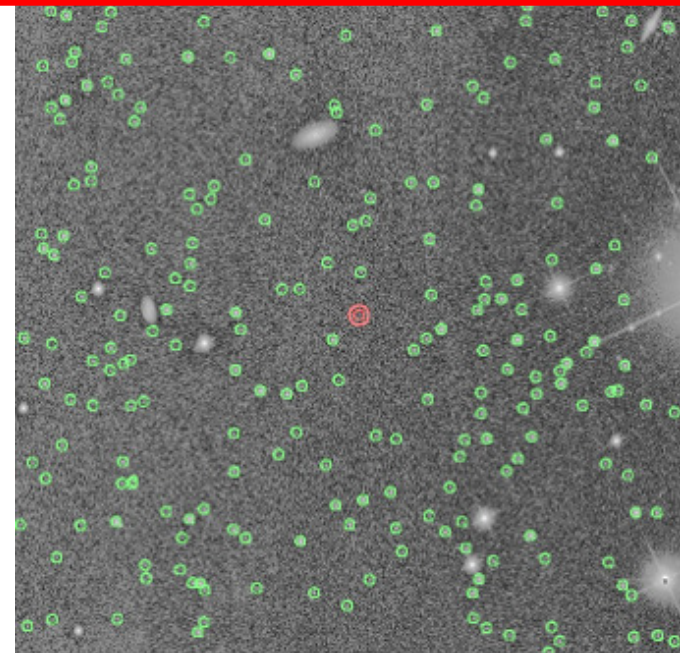
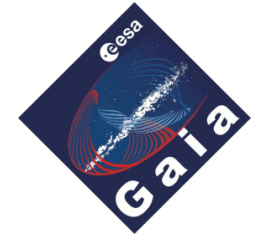


Image du satellite Gaia prise par le LT le 21/08/2015

Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



http://gbot.obspm.fr/fov/ dbgaialaunch

gbot:8080/dbgaialaunch/

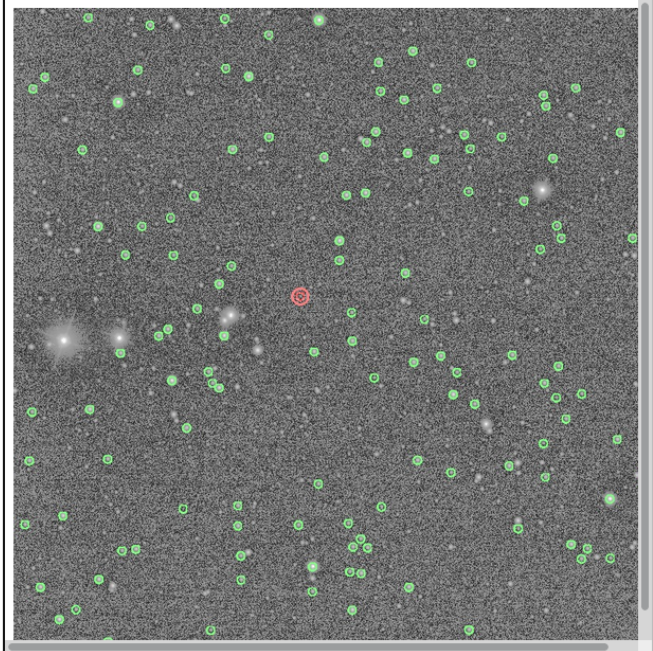
sga da dbgaialaunch SOLASTRO>ENTRY>TSOLASTROEntry

about

Previous Next Show 10 entries Showing 1 to 10 of 15 entries

Access	Rel : SOLASTRO_OBSERVATIONS	Rel : SOLASTRO_SOURCES	Rel : SOLASTRO_CATALOGS	Rel : SOLASTRO_PREVIEWS	Rel : SOLASTRO_TARGETZOOM	Rel : SOLASTRO_F
		1 links	1 links			
		1 links	1 links			

Preview of getproduct?oid=2019020012240502812



Position Const on Key

Result Limit 100

2/2

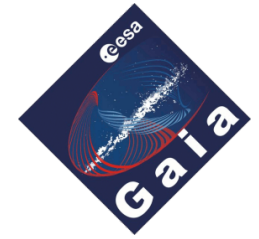
Query Mode SaadaQL

Select ENTRY From TS
WhereAttributeSaada {
oidtable = 28935630
Limit 100

Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Responsabilités de l'Observatoire de Paris (SyRTE) :

- 1 - Fournir l'éphéméride et les cartes de champ de la sonde aux Observatoires.
- 2 - Récupérer, archiver et distribuer les observations et les résultats des réductions.
(*Res. C. Barache & T. Carlucci*)

3 - **Développer les logiciels semi-automatique de réduction astrométrique d'images CCD.**

(*Resp. S. Bouquillon & F. Taris*)

4 - Délivrer les résultats à l'ESA chaque mois.

5 - Retraiter l'ensemble des images avec le catalogue Gaia

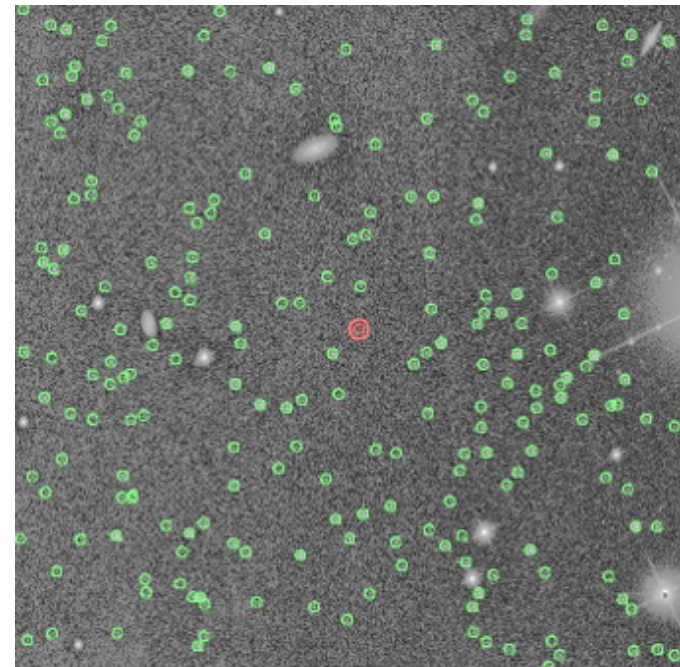
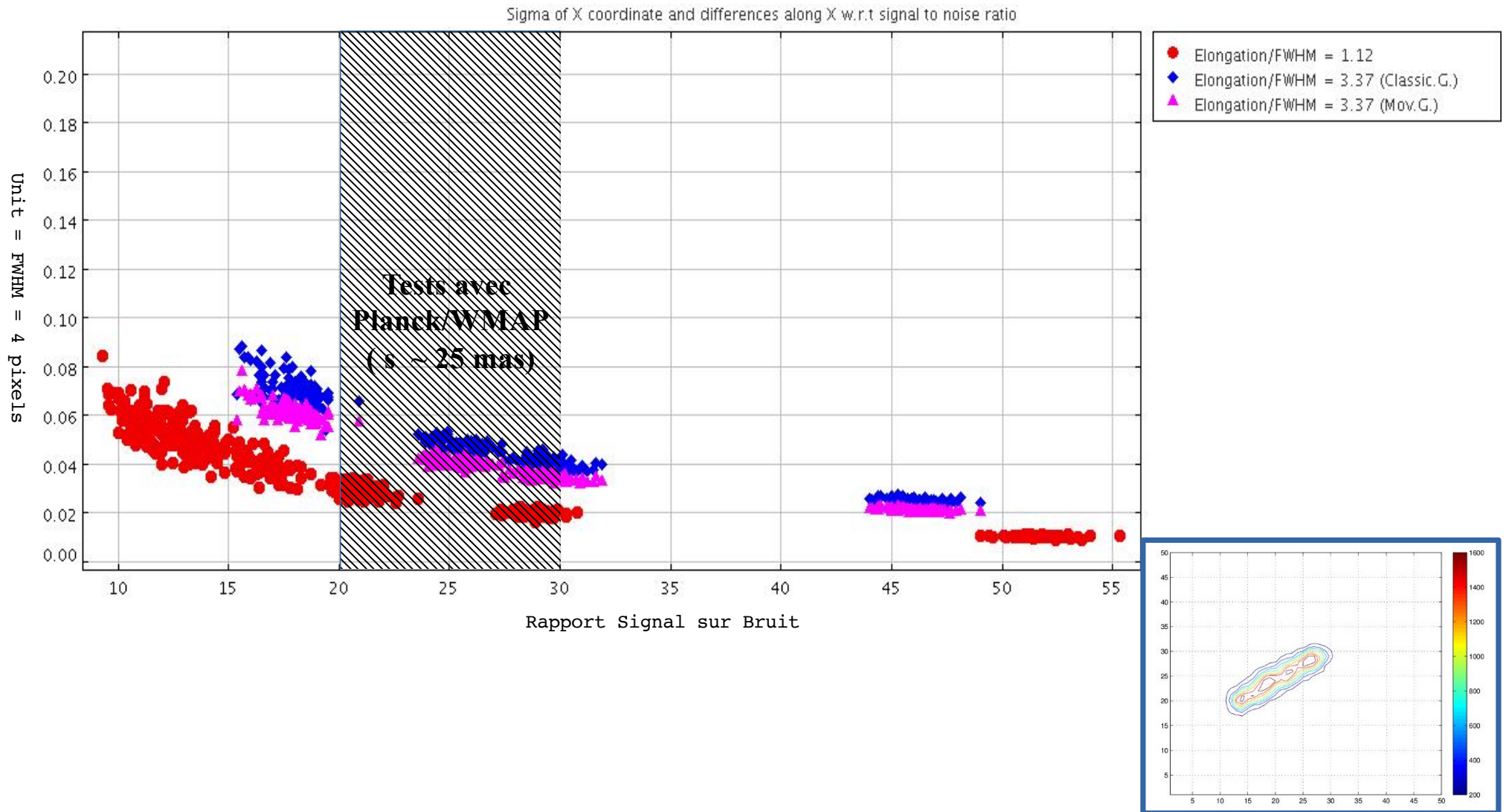
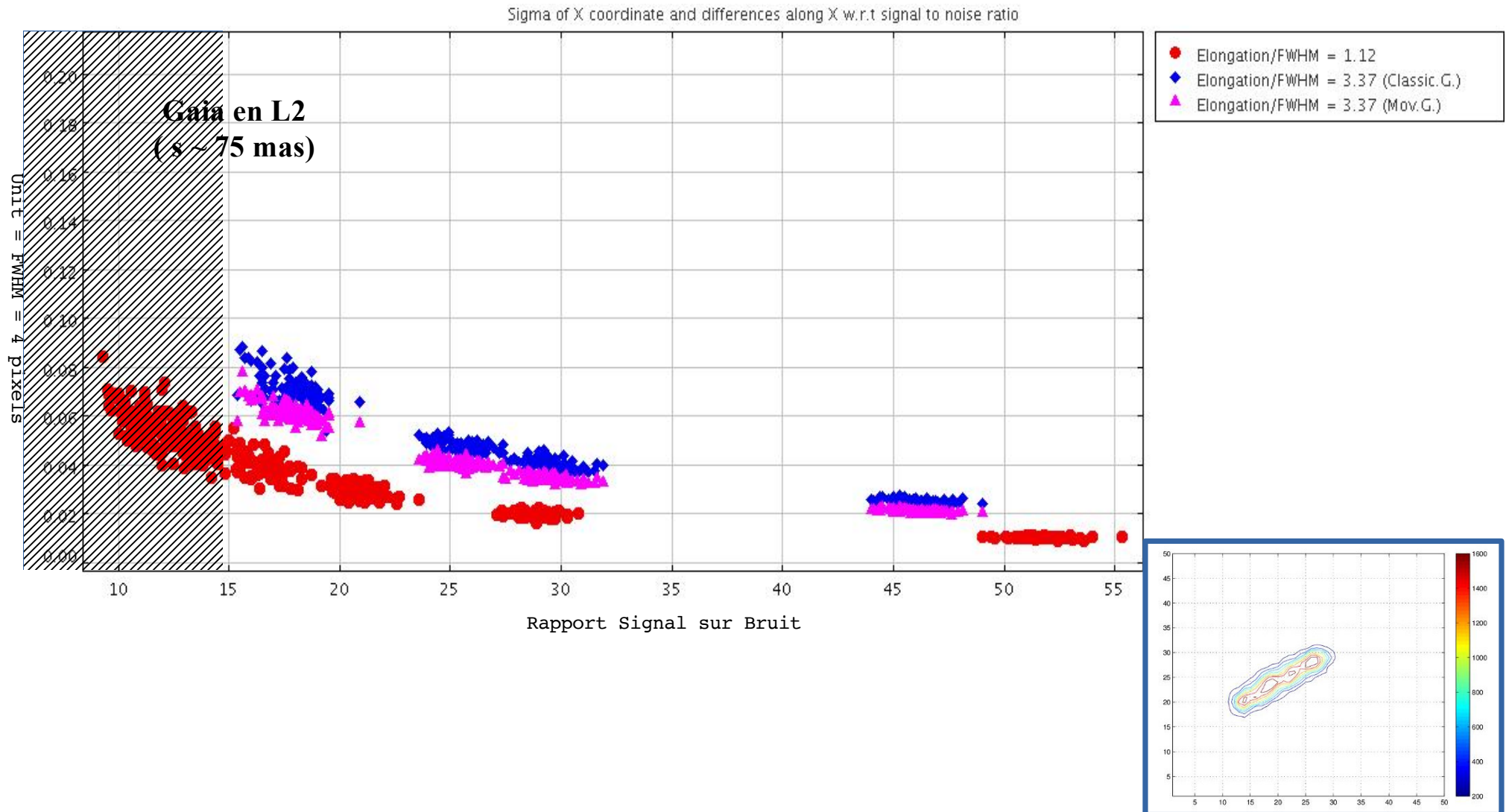


Image du satellite Gaia prise par le LT le 21/08/2015

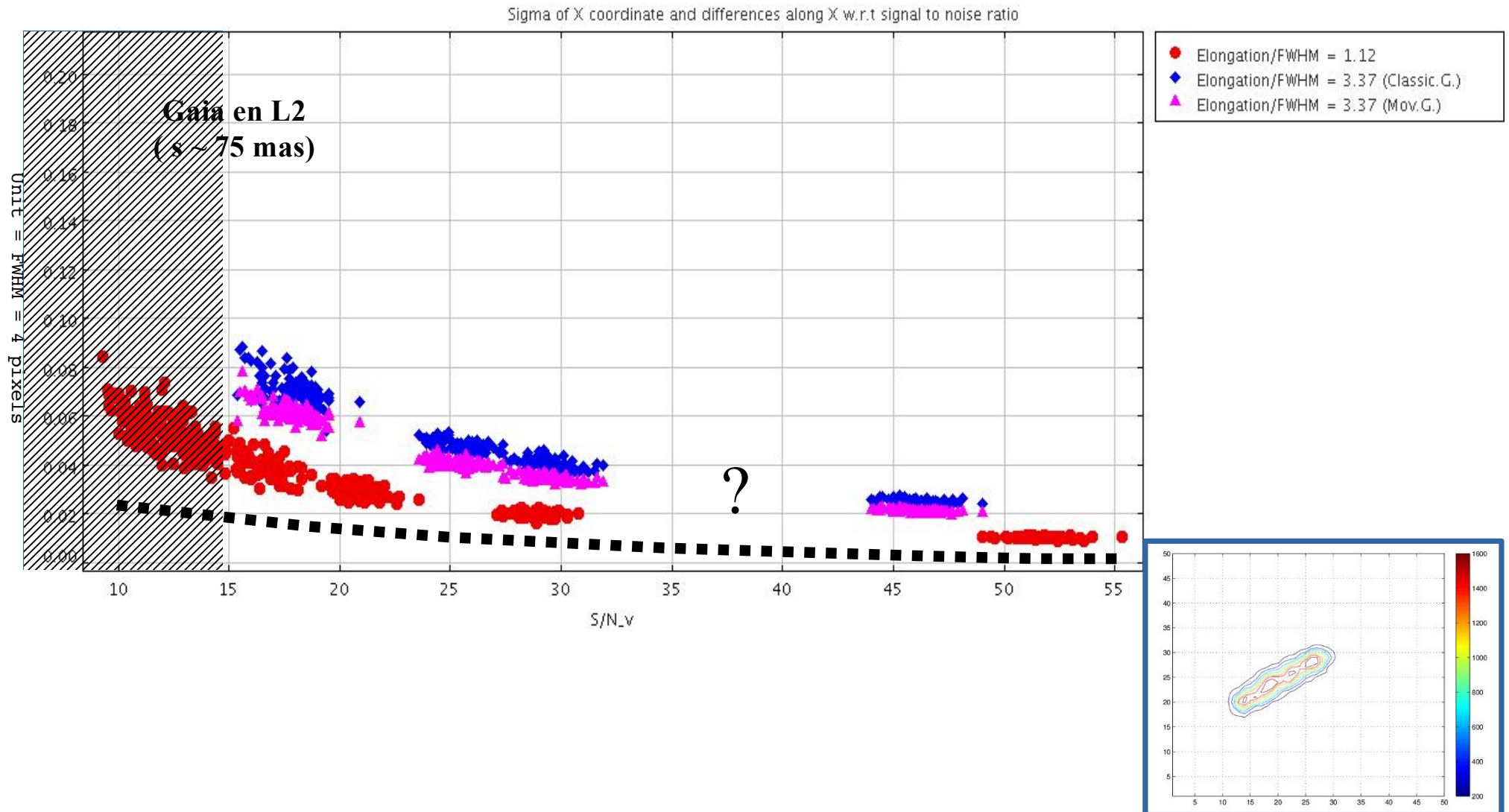
L'outil de réduction astrométrique GBOT

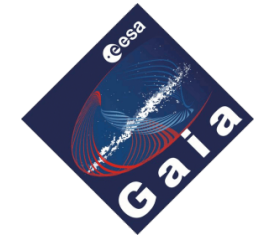


L'outil de réduction astrométrique GBOT



Astrométrie CCD des objets en mouvement





Characterization of the astrometric precision limit for moving targets observed with digital array sensors*

S. Bouquillon¹, R. A. Mendez¹, M. Altmann^{1,3},
T. Carlucci¹, C. Barache¹, F. Taris¹, A.H. Andrei^{1,4}, and R. Smart⁵

¹ SYRTE, Observatoire de Paris, PSL Research University, CNRS, Sorbonne Universités, UPMC Univ. Paris 06, LNE, 61 avenue de l'Observatoire, 75014 Paris, France

e-mail: sebastien.bouquillon@obspm.fr

² Departamento de Astronomía, Facultad de Ciencias Físicas y Matemáticas, Universidad de Chile, Casilla 36-D, Santiago, Chile

³ Zentrum für Astronomie der Universität Heidelberg, Astronomisches Recheninstitut, Mönchhofstr. 12-14, 69120 Heidelberg, Germany

⁴ Observatório Nacional, MCTI, Rua Gal. José Cristino 77, Rio de Janeiro, RJ CEP 20921-400, Brasil

⁵ Istituto Nazionale di Astrofisica, Osservatorio Astrofisico di Torino, Strada Osservatorio 20, I-10025 Pino Torinese, Italy

Received ... ; accepted ...

ABSTRACT

aims. We investigate the maximum astrometric precision reachable on moving targets observed with digital sensor arrays, and provide an estimation for its ultimate lower limit based on the Cramér-Rao bound.

Methods. We extend previous work on one dimensional Gaussian PSFs focusing on moving objects and extending the scope to two-dimensional array detectors. In this study the PSF of a stationary point-source celestial body is replaced by its convolution with a linear motion, thus effectively modeling the spread function of a moving target.

Results. The expressions of the Cramér-Rao lower bound deduced by this method allows us to study in great detail the limit of astrometric precision reachable for moving celestial objects, and to compute an optimal exposure time according to different observational parameters such as seeing, detector pixel size, decentering, and elongation of the source due to its drift.

Key words. Astrometry, CCD sensors, Cramér-Rao bound, asteroids, artificial satellites.

1. Introduction

One of the most crucial steps in the derivation of accurate and precise positions of objects on astronomical images is source extraction and plate coordinate determination. The final astrometric quality of the whole measurement process is dominated by this step. Therefore understanding the key mechanisms defining

Most of the astronomical projects involved in asteroids detection and observation, such as Spacewatch (Rabinowitz 1991) or Pan-STARRS (Kaiser et al. 2010), have used (and still largely use) the usual two-dimensional Gaussian as the Point Spread Function (PSF) of moving objects for their detection as well as for their photometric and astrometric reductions. But the two-dimensional Gaussian is not well adapted as a representation for

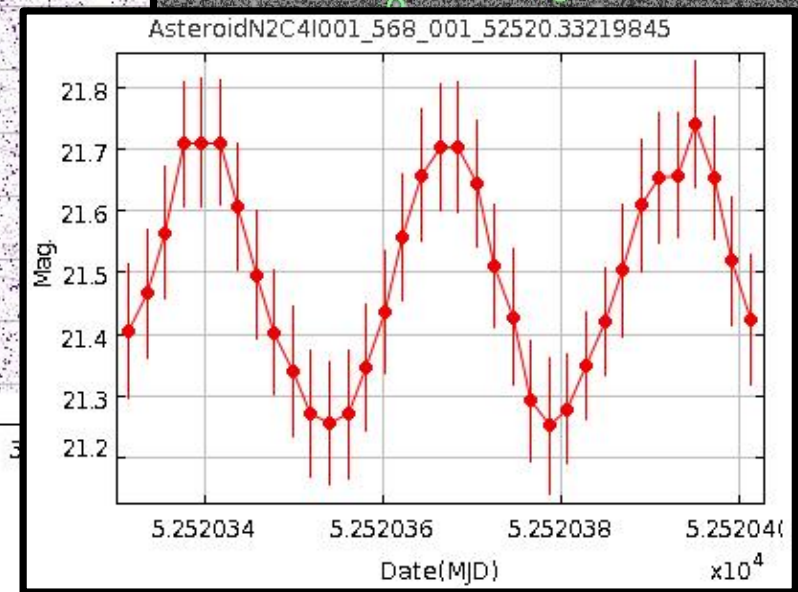
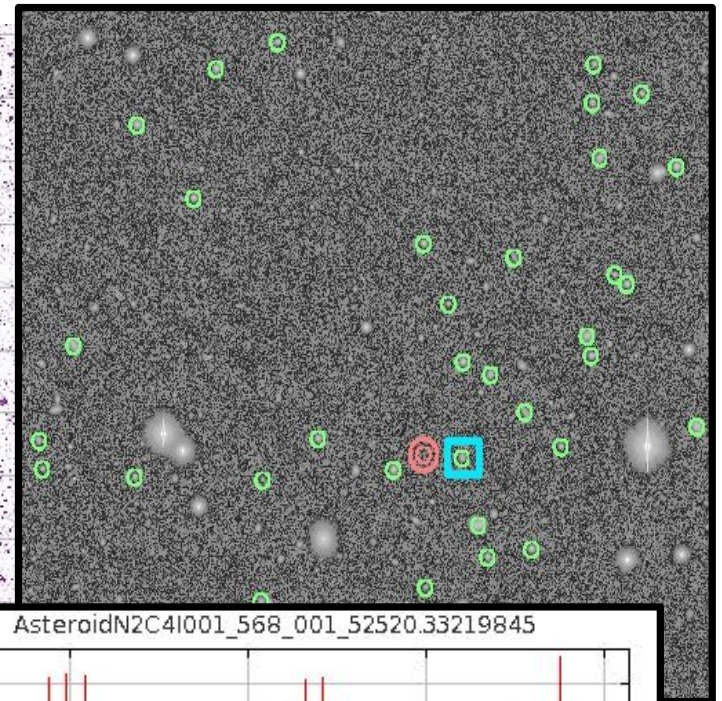
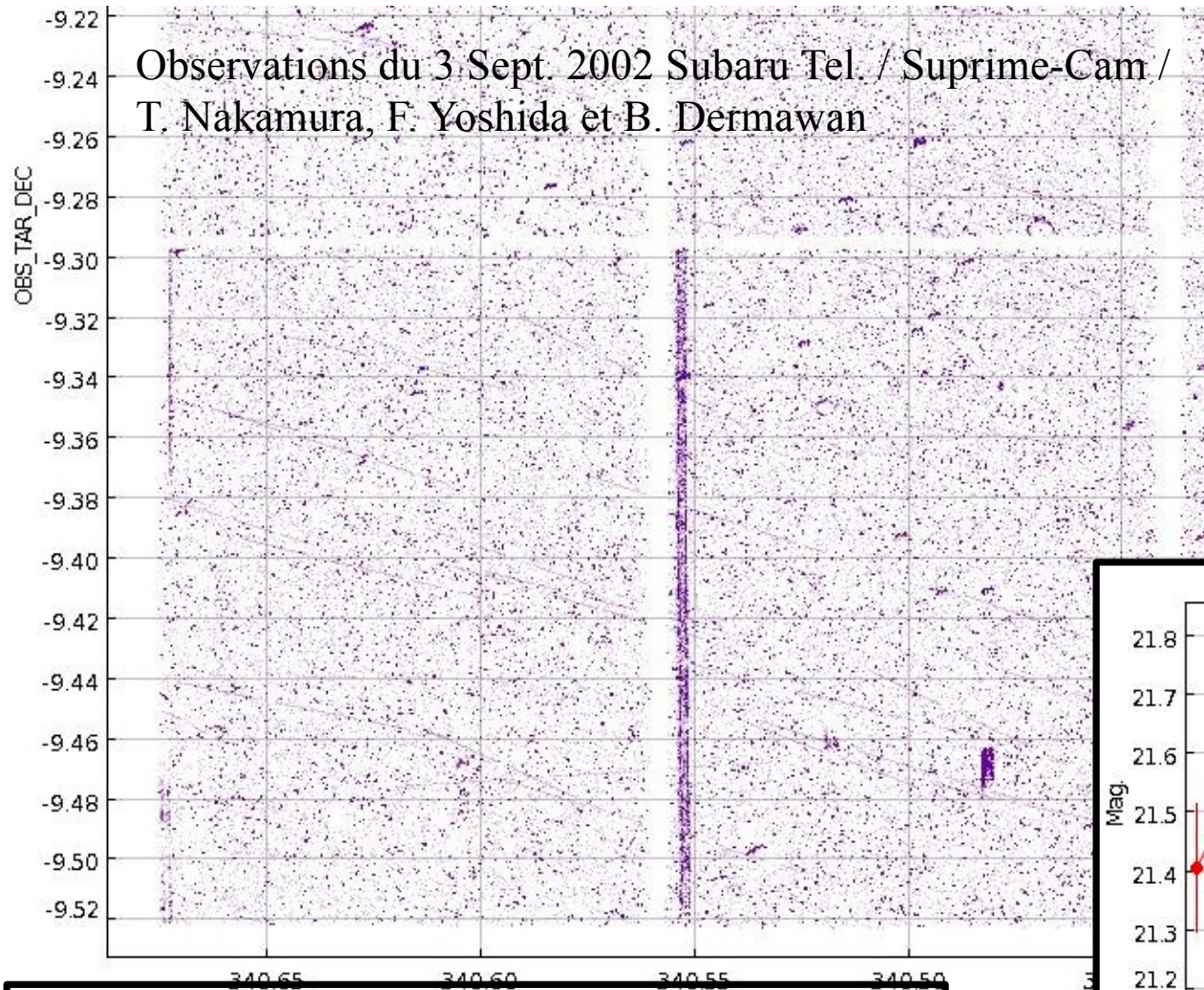
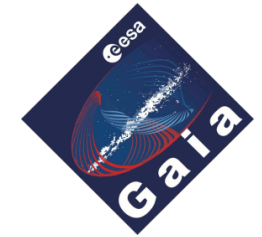
- Recherche en partie financé par la
ministère de la recherche chilienne : bourse
FONDECYT de 3 ans (2015-2017)

- PTV Observatoire de Paris 2016

Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



- Alertes Gaia à l'OHP,
- NEO shield, ...

Responsabilités de l'Observatoire de Paris (SyRTE) :

- 1 - Fournir l'éphéméride et les cartes de champ de la sonde aux Observatoires.
- 2 - Récupérer, archiver et distribuer les observations et les résultats des réductions.
(Res. T. Carlucci & C. Barache)
- 3 - Développer les logiciels semi-automatique de réduction astrométrique d'images CCD.
(Resp. F. Taris & S. Bouquillon)
- 4 - Délivrer les résultats à l'ESA chaque mois.**
- 5 - Retraiter l'ensemble des images avec le catalogue Gaia

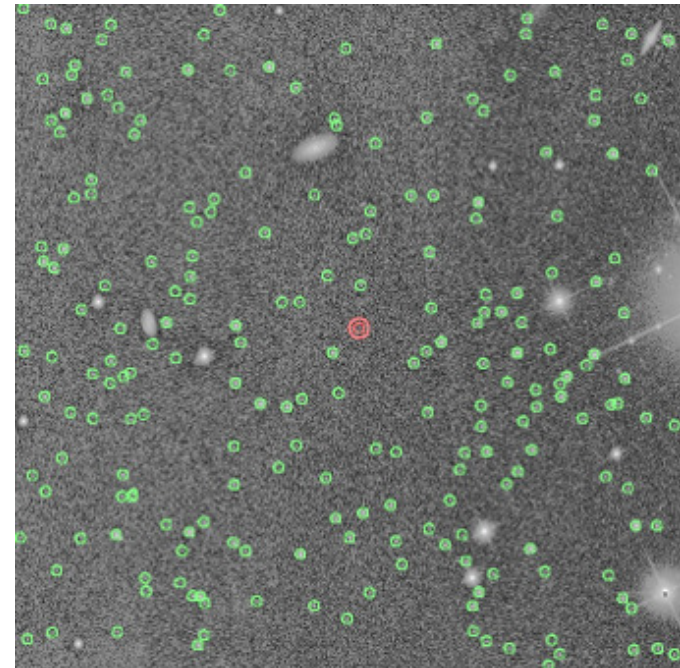
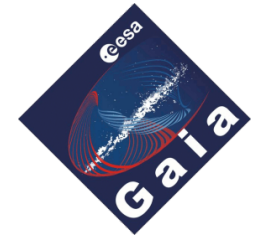


Image du satellite Gaia prise par le LT le 21/08/2015

Gaia-GBOT

Ground Based Optical Tracking of Gaia

M. Altmann, C. Barache, S. Bouquillon, T. Carlucci, F. Taris



Responsabilités de l'Observatoire de Paris (SyRTE) :

- 1 - Fournir l'éphéméride et les cartes de champ de la sonde aux Observatoires.
- 2 - Récupérer, archiver et distribuer les observations et les résultats des réductions.
(Res. T. Carlucci & C. Barache)
- 3 - Développer les logiciels semi-automatique de réduction astrométrique d'images CCD.
(Resp. F. Taris & S. Bouquillon)
- 4 - Délivrer les résultats à l'ESA chaque mois.

5 - Retraiter l'ensemble des images avec le catalogue Gaia

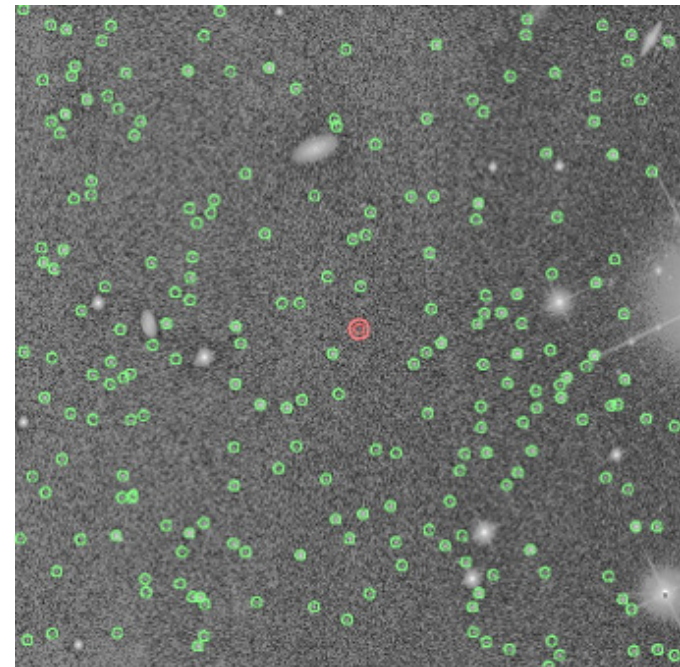


Image du satellite Gaia prise par le LT le 21/08/2015

PPMXL / GAIA DR1
1 – Calibration

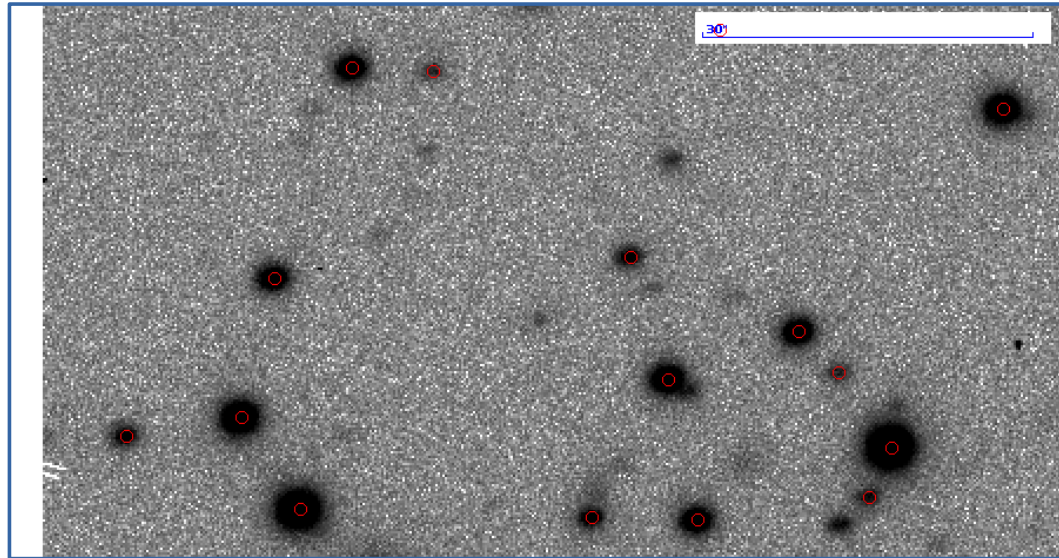


Image du VST (CCD n° 12)
prise le 22 juillet 2014

PPMXL / GAIA DR1 1 – Calibration

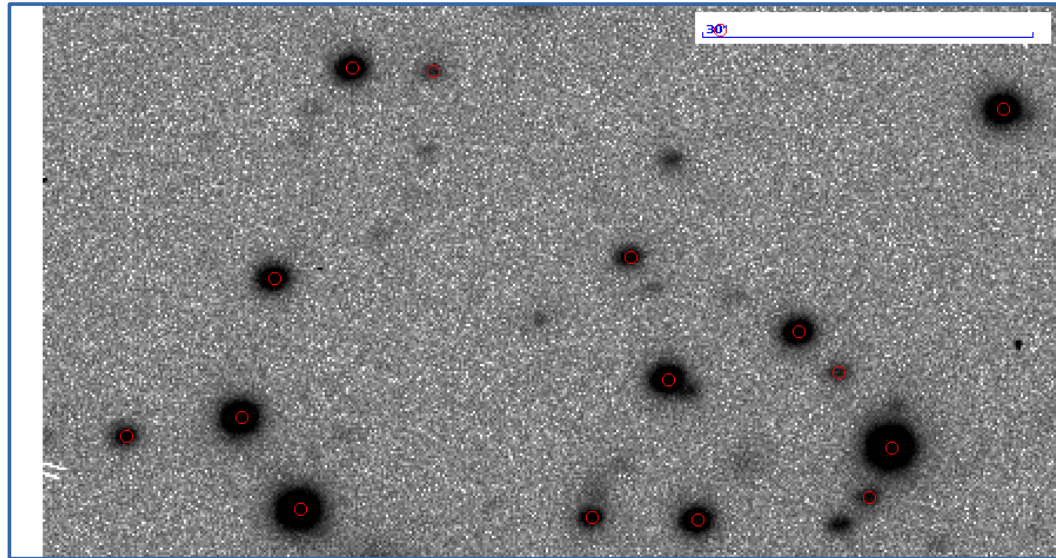
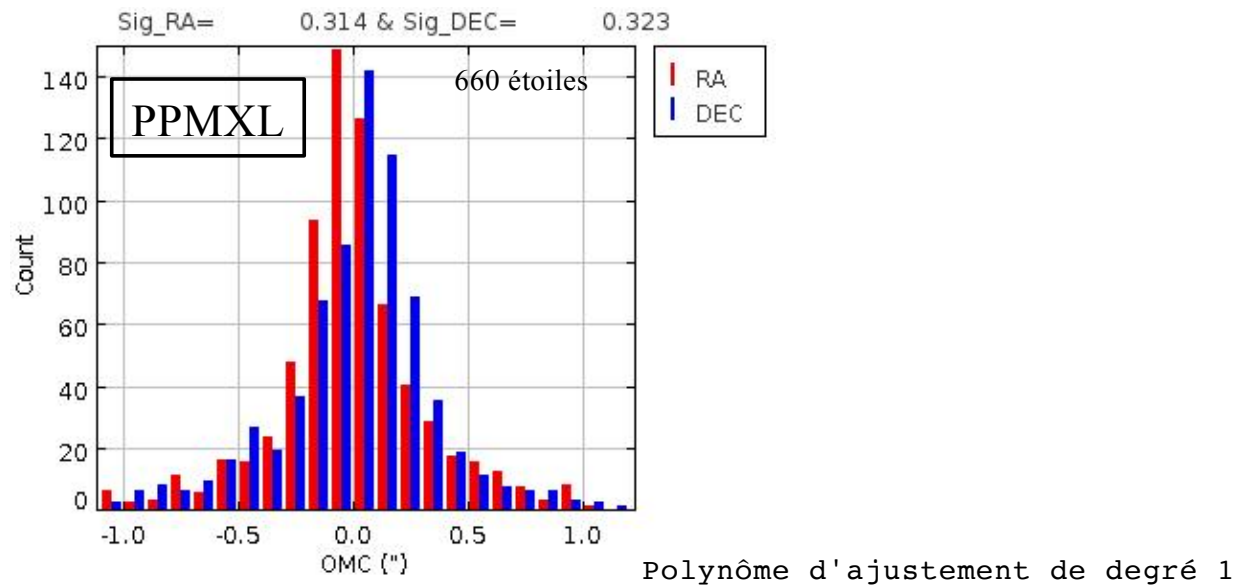


Image du VST (CCD n° 12)
prise le 22 juillet 2014



PPMXL / GAIA DR1 1 – Calibration

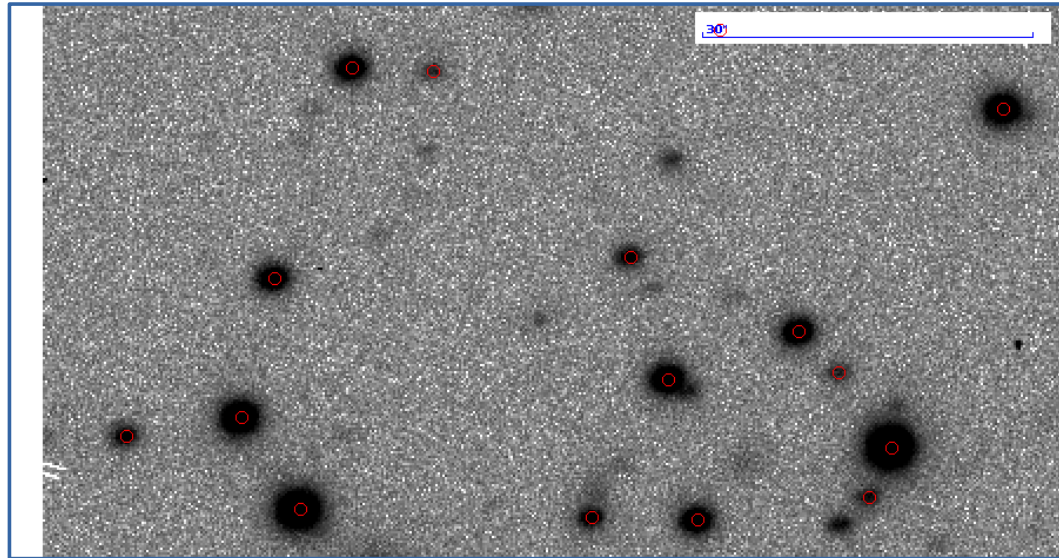
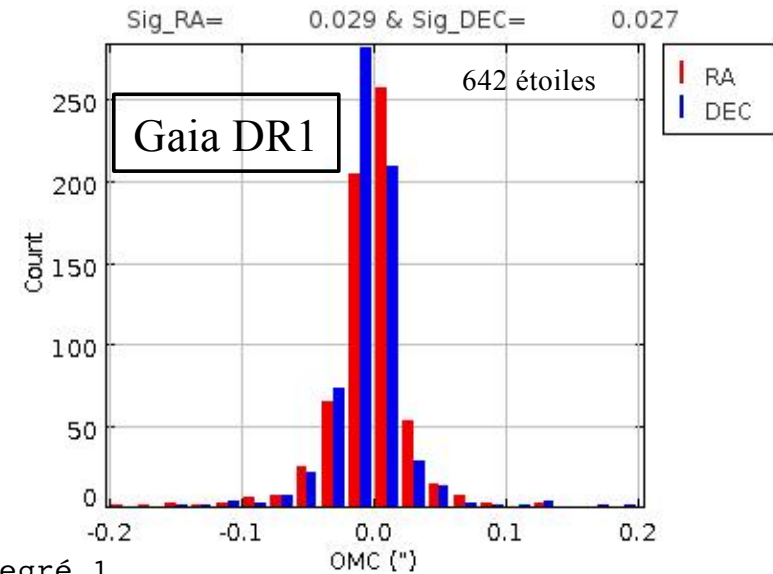
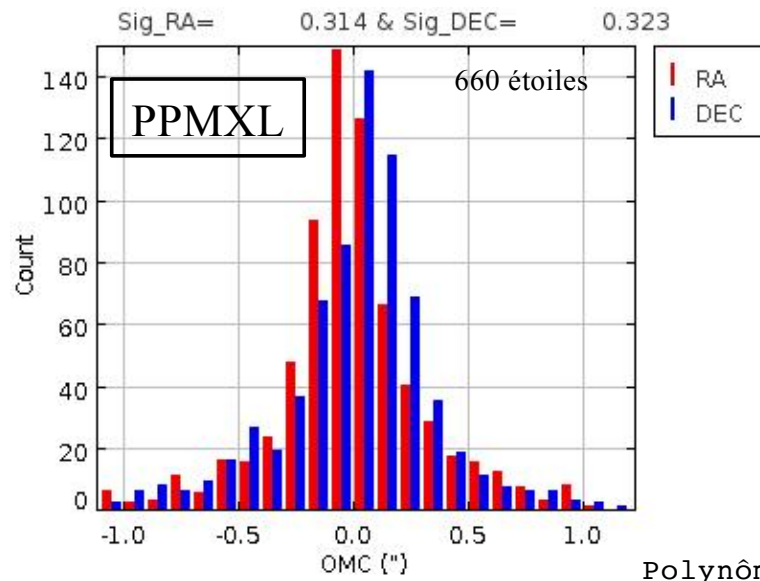


Image du VST (CCD n° 12)
prise le 22 juillet 2014



PPMXL / GAIA DR1 1 – Calibration

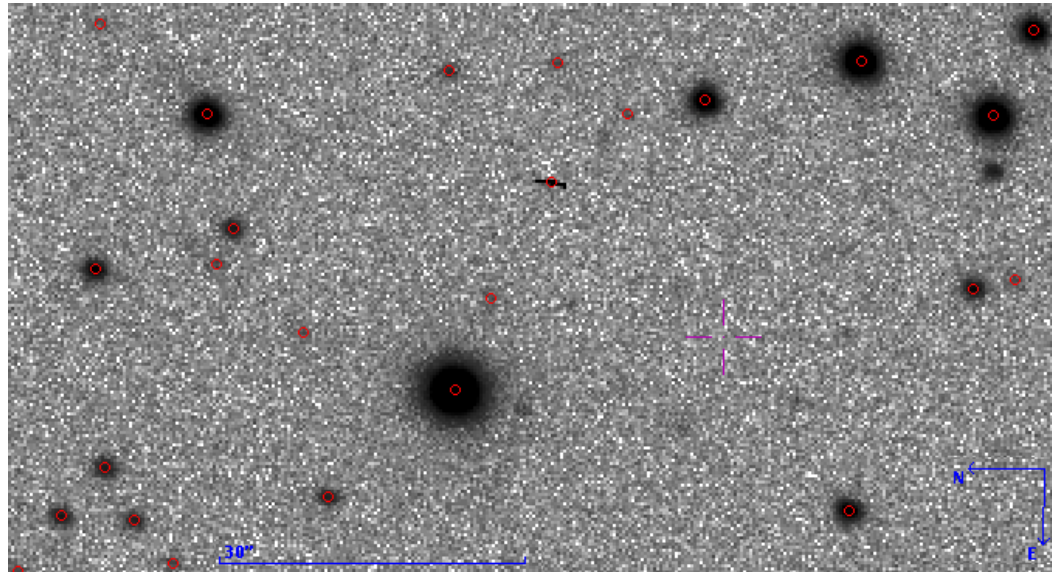
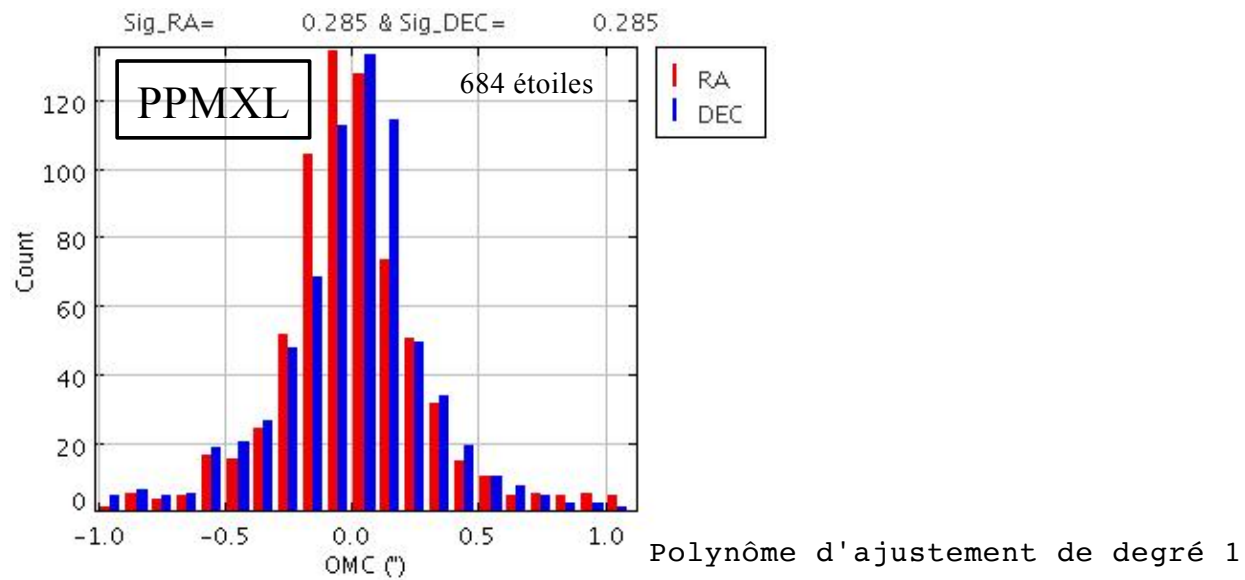


Image du LT (IO:O)
prise le 22 juillet 2014



PPMXL / GAIA DR1 1 – Calibration

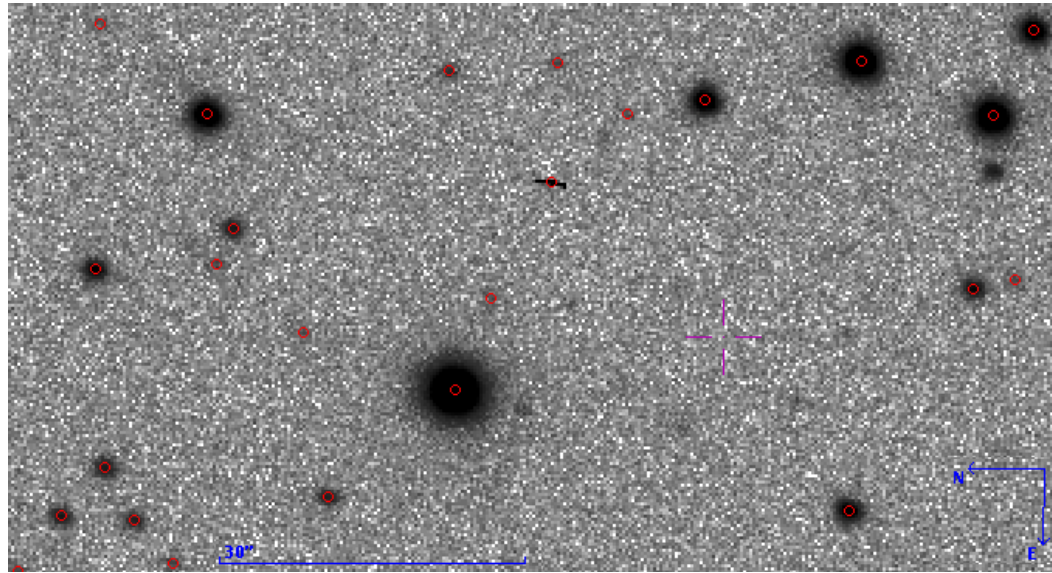
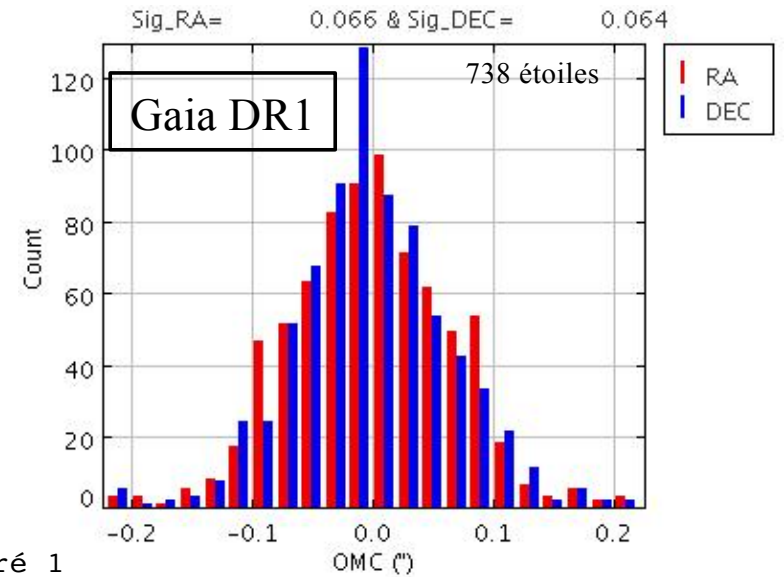
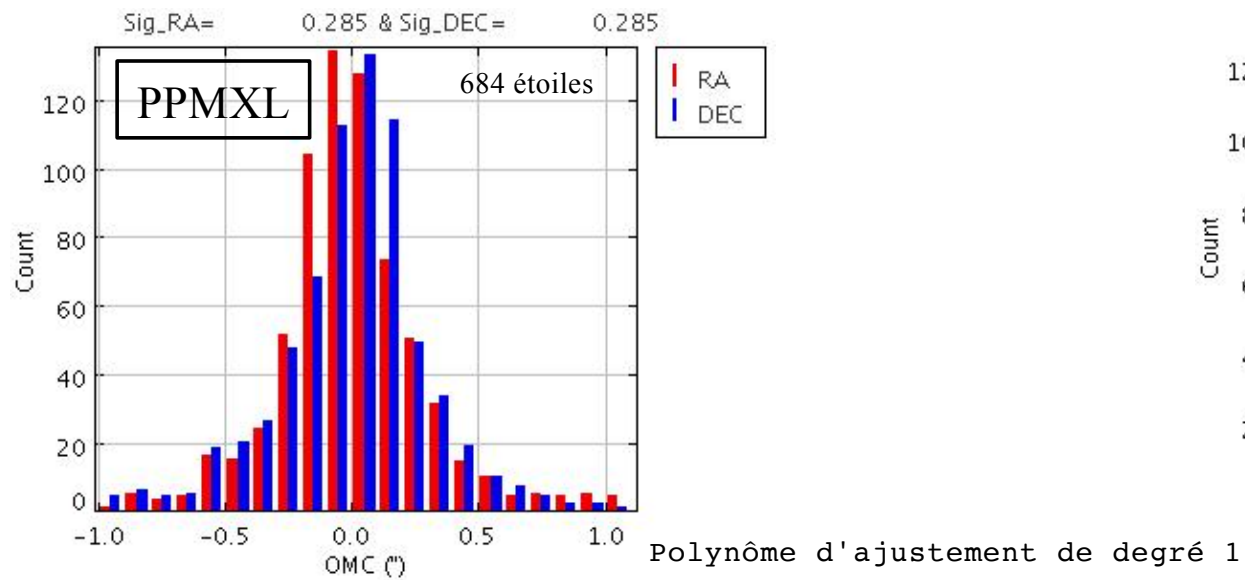


Image du LT (IO:O)
prise le 22 juillet 2014



PPMXL / GAIA DR1 1 – Calibration

Image VST (CCD n° 12) 22/07/2014

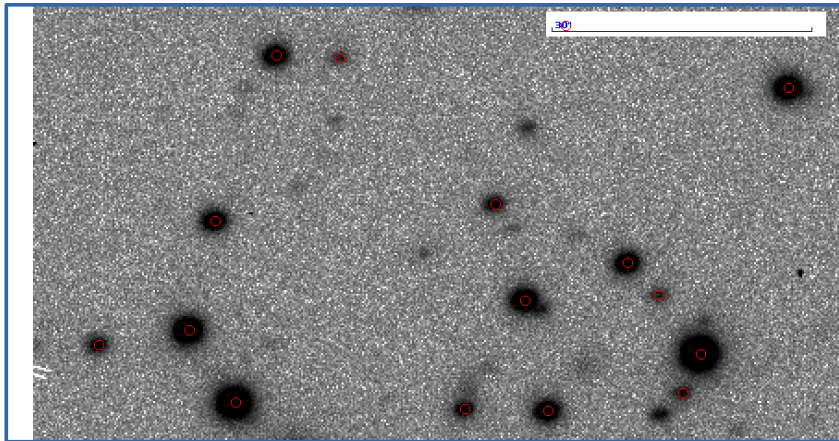
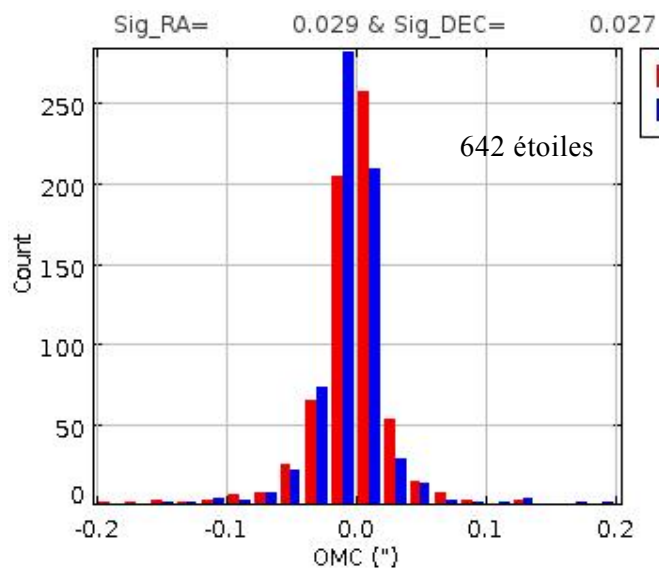
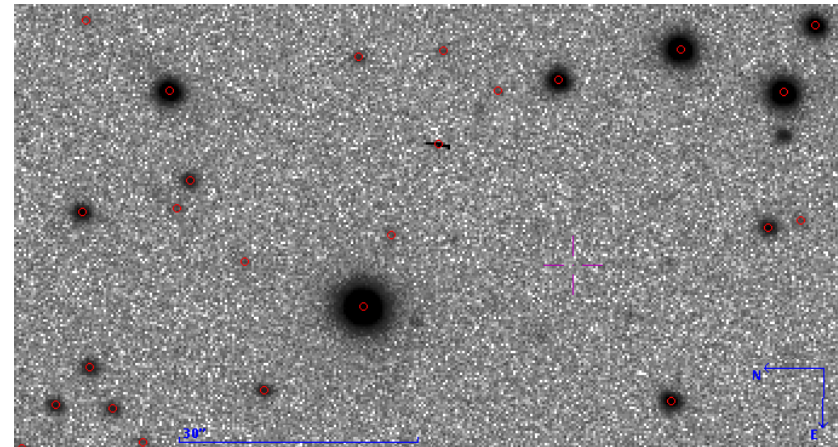
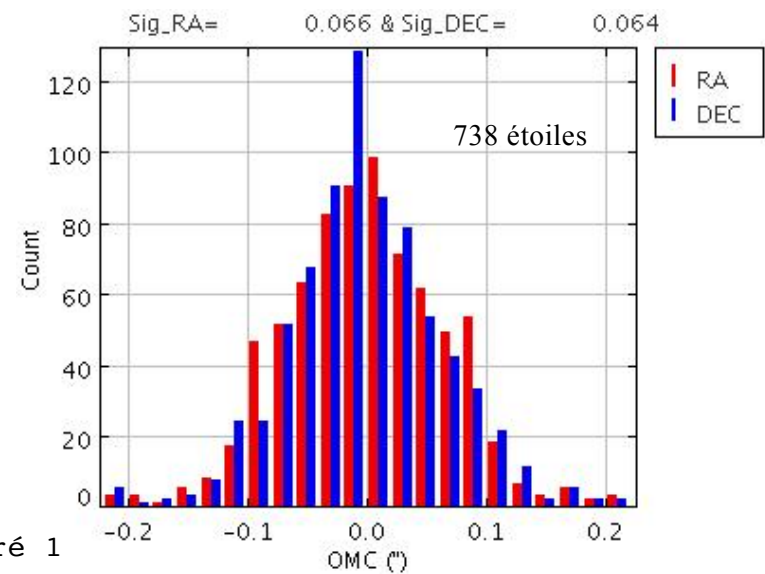


Image LT 22/07/2014

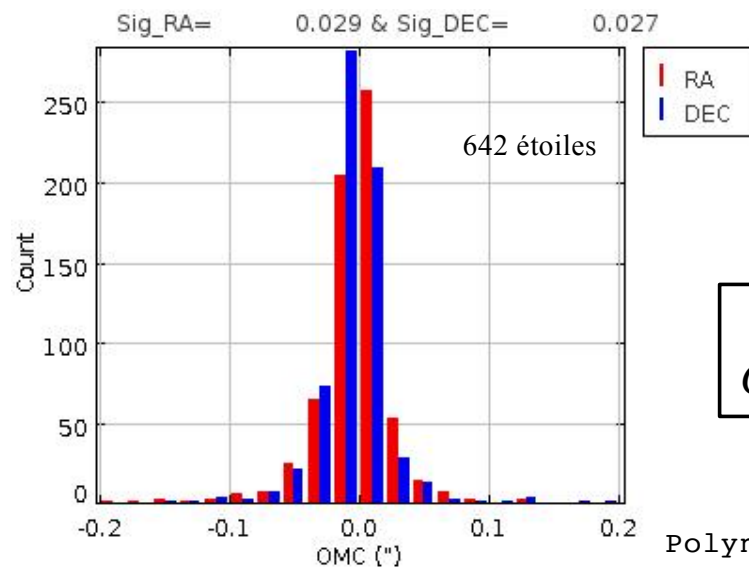
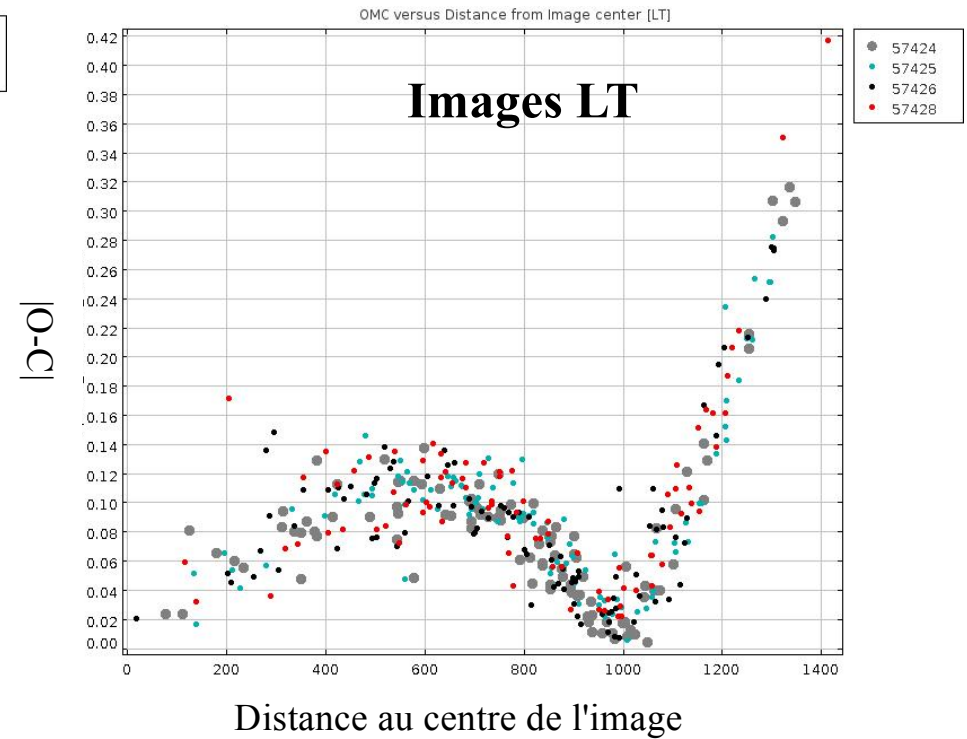
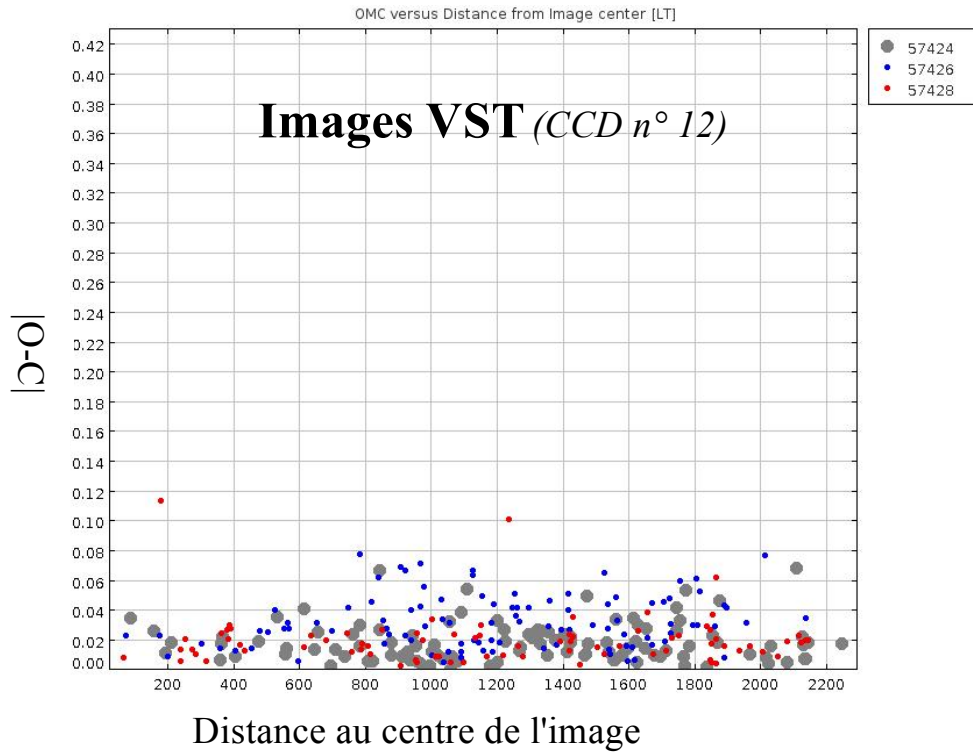


*Avec le
Catalogue Gaia DR1*

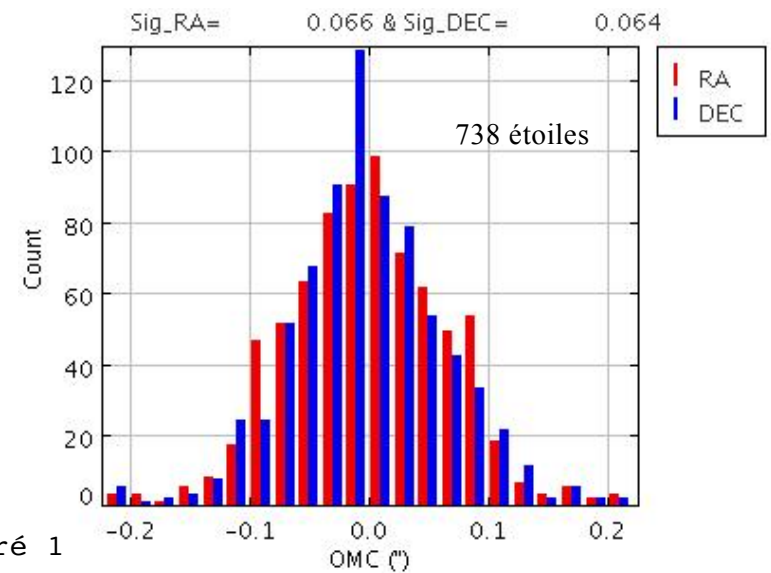
Polynôme d'ajustement de degré 1



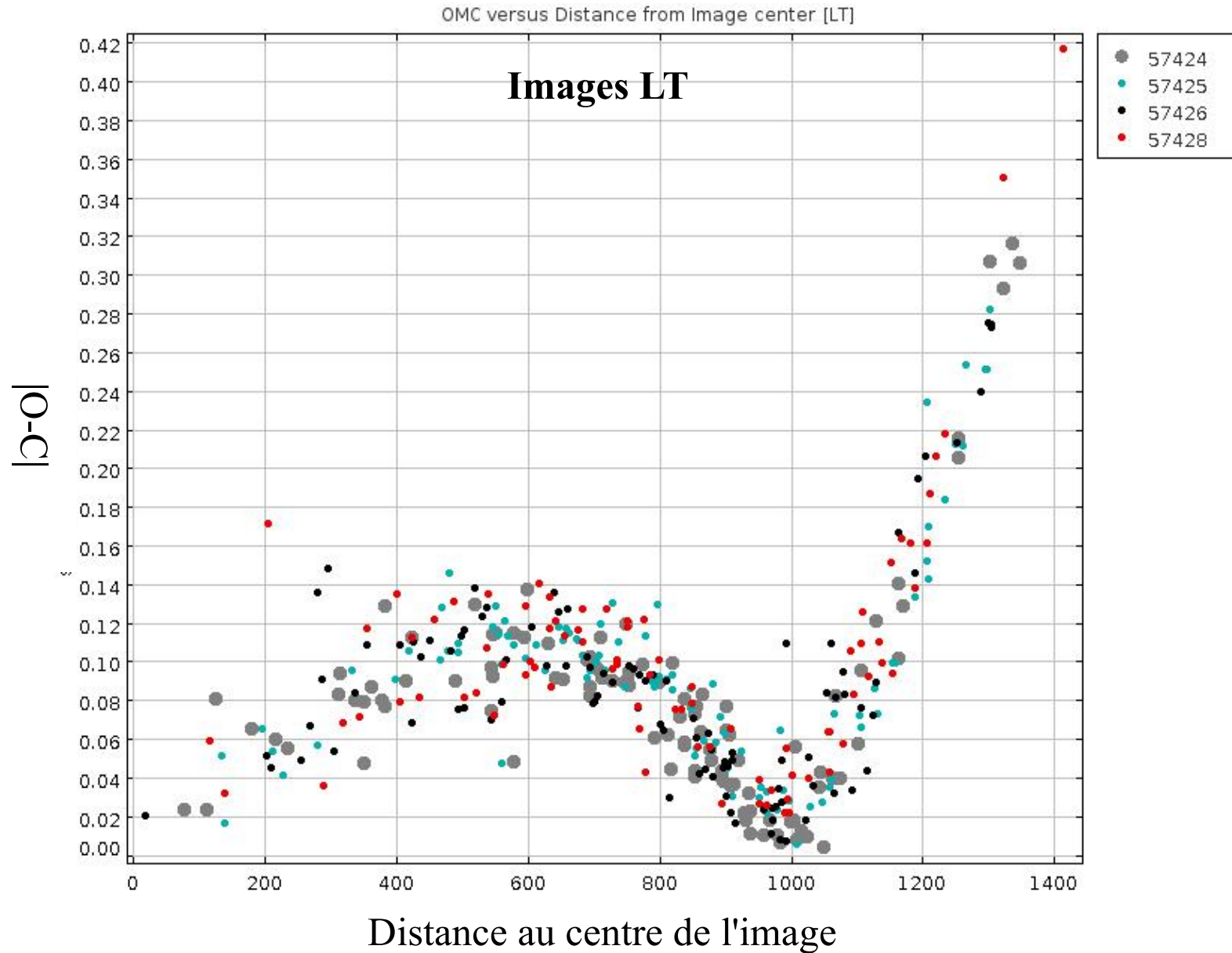
PPMXL / GAIA DR1 1 – Calibration



*Avec le
Catalogue Gaia DR1*

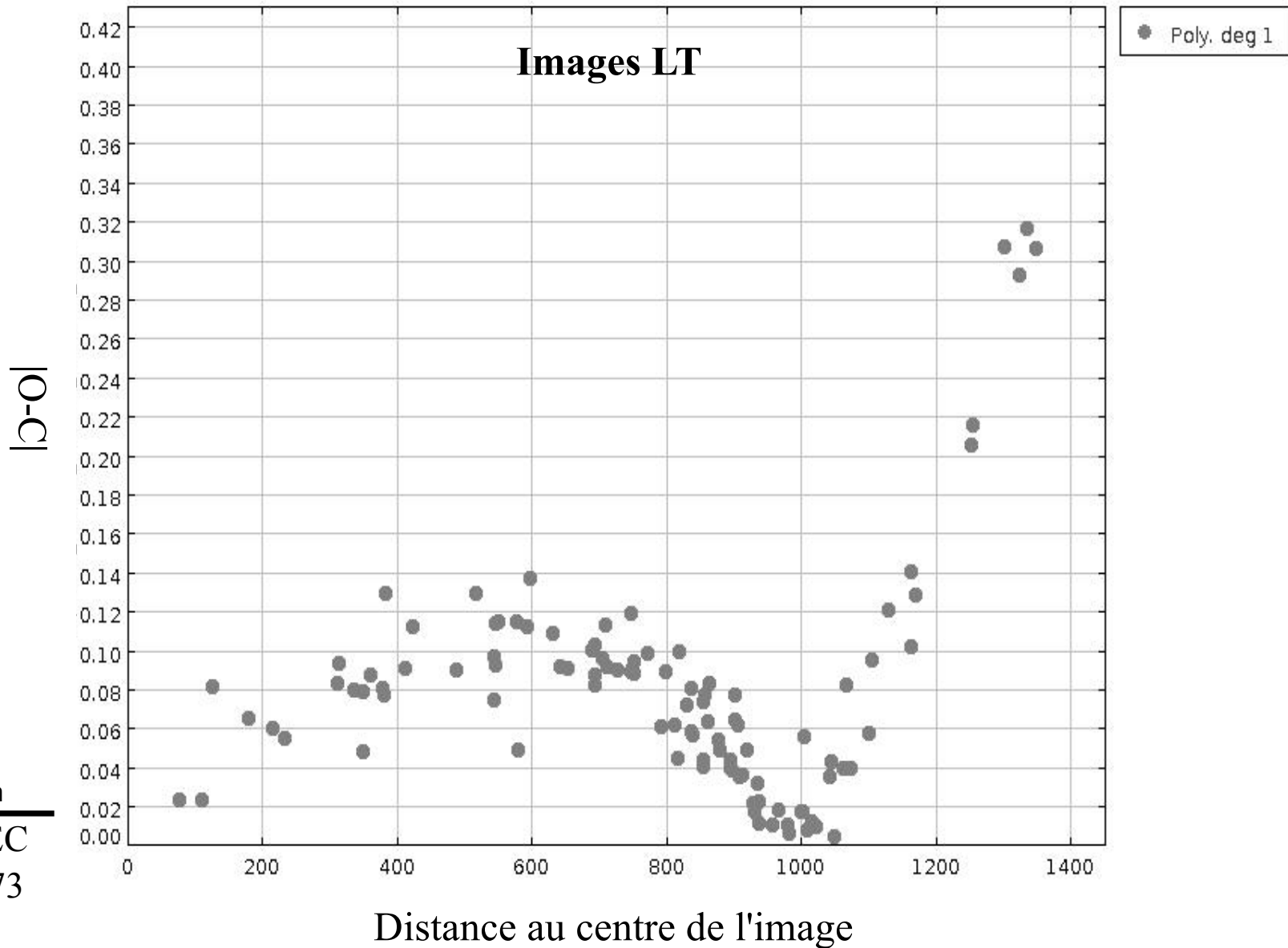


PPMXL / GAIA DR1 1 – Calibration



PPMXL / GAIA DR1
1 – Calibration

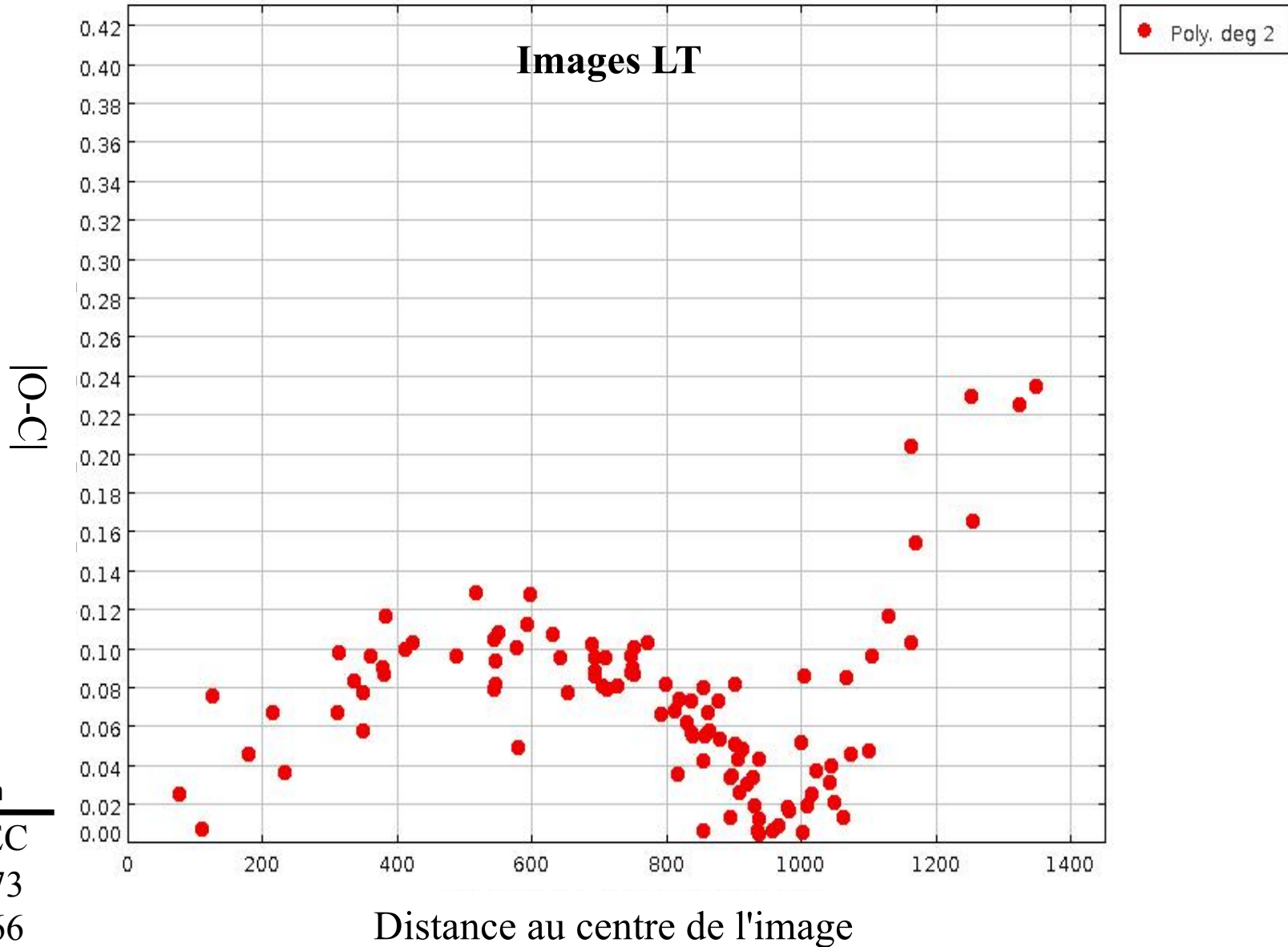
57424 (LT)



$\sigma_{\text{calibration}}$
RA : DEC
0.071 : 0.073

PPMXL / GAIA DR1
1 – Calibration

57424 (LT)

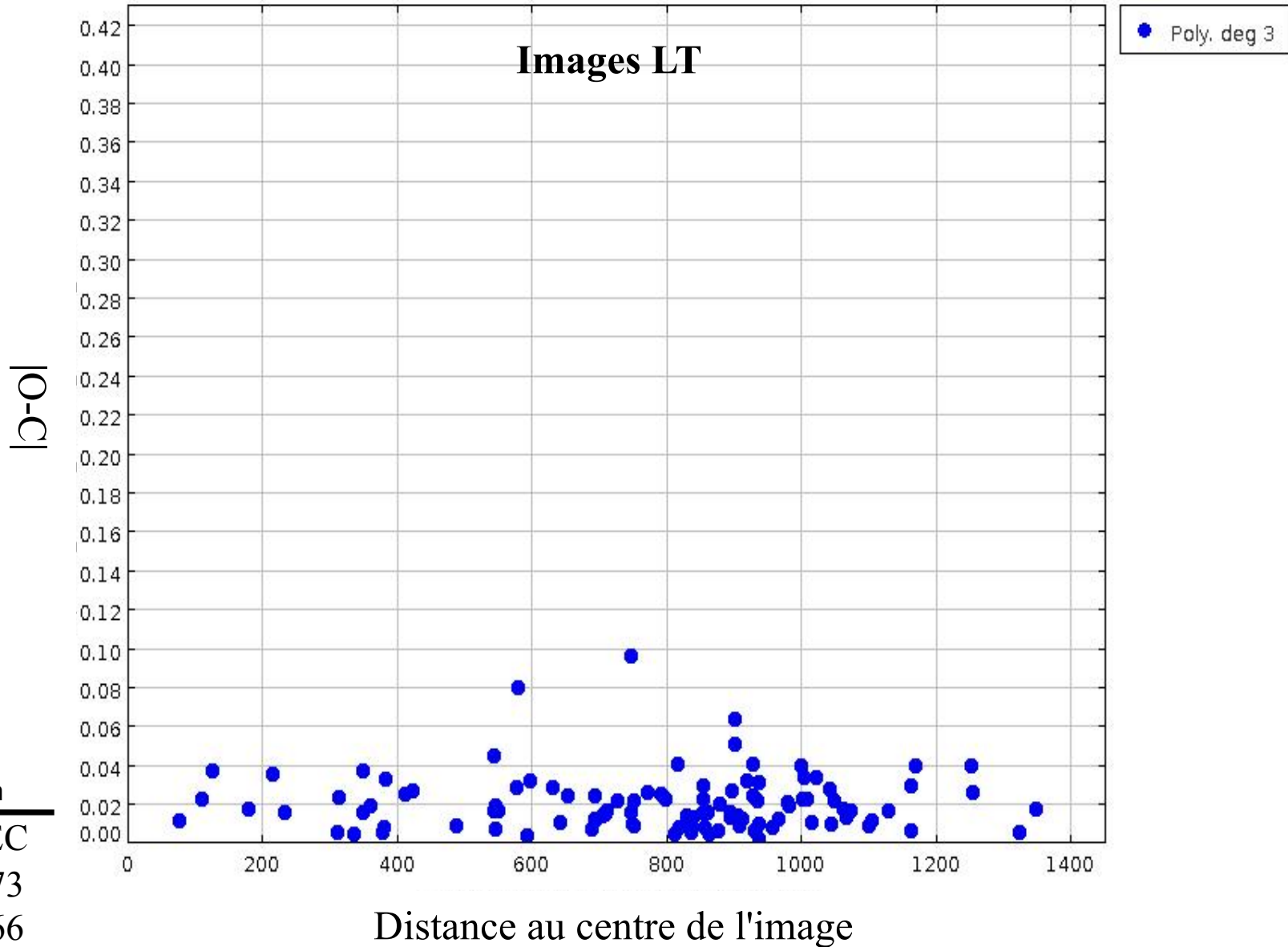


$\sigma_{\text{calibration}}$

RA : DEC
0.071 : 0.073
0.065 : 0.066

PPMXL / GAIA DR1
1 - Calibration

57424 (LT)



$\sigma_{\text{calibration}}$

RA : DEC
0.071 : 0.073
0.065 : 0.066
0.025 : 0.026

PPMXL / GAIA DR1
2 – Position de Gaia

Image VST (*CCD n° 12*) 22/07/2014

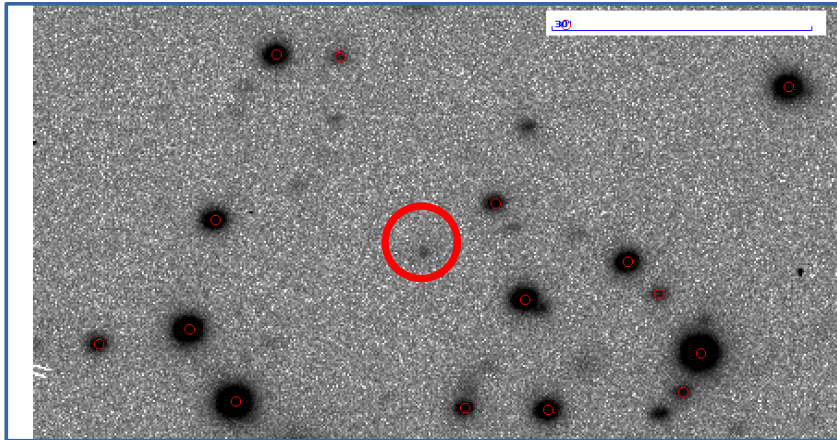
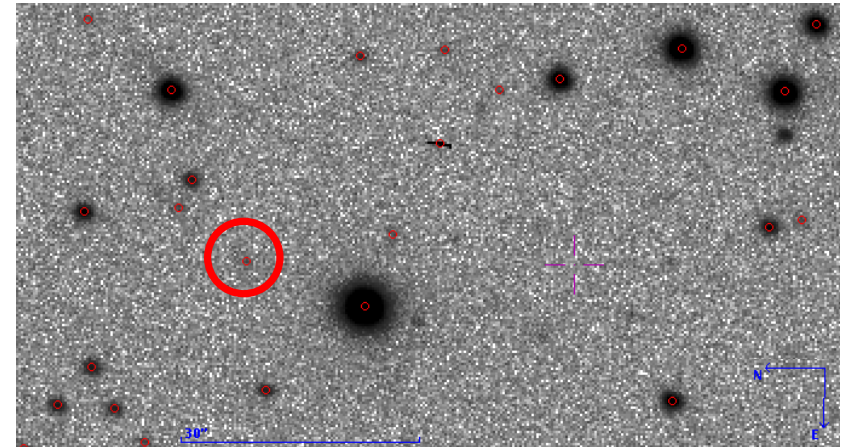


Image LT 22/07/2014



PPMXL / GAIA DR1
2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

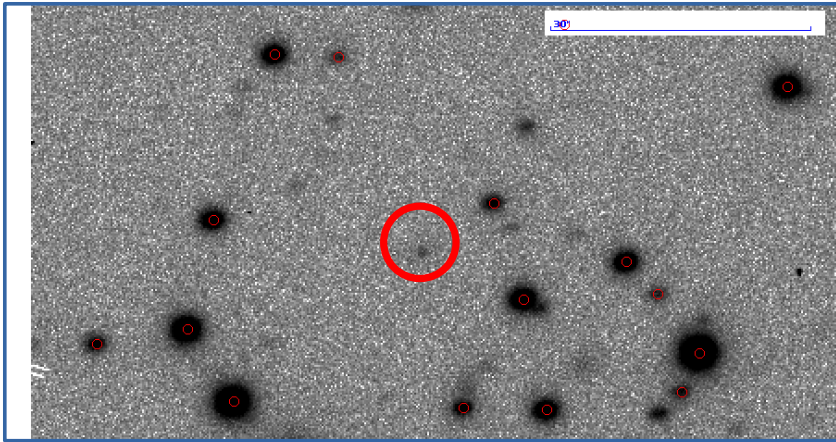
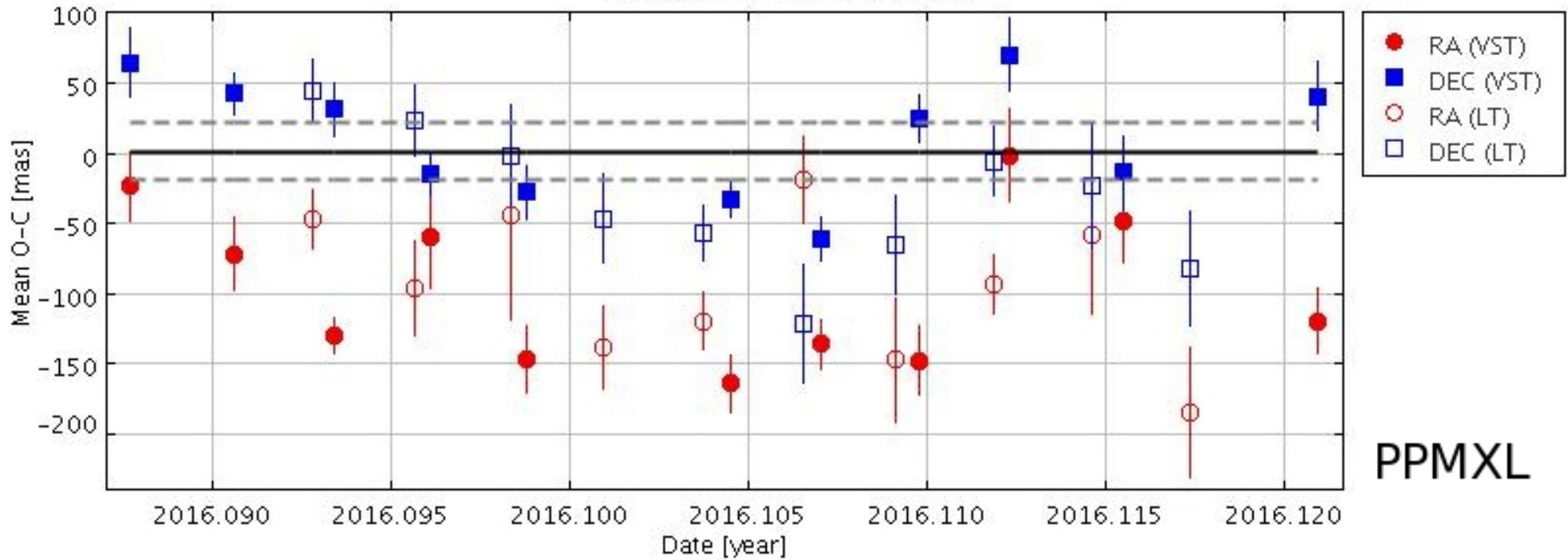
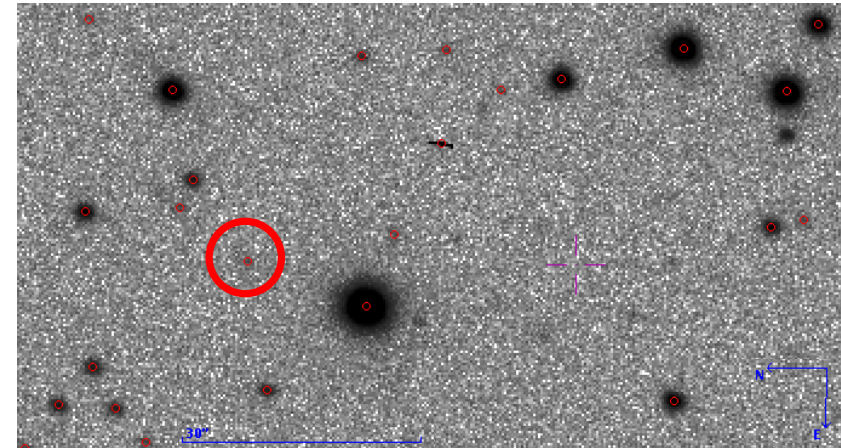


Image LT 22/07/2014



PPMXL / GAIA DR1
2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

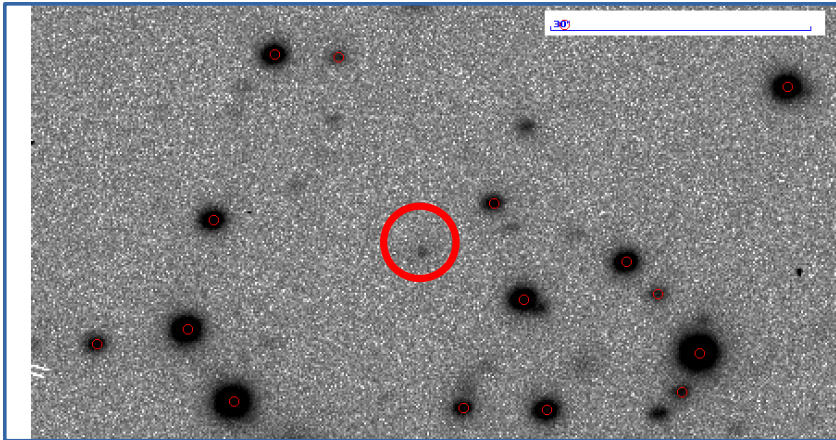
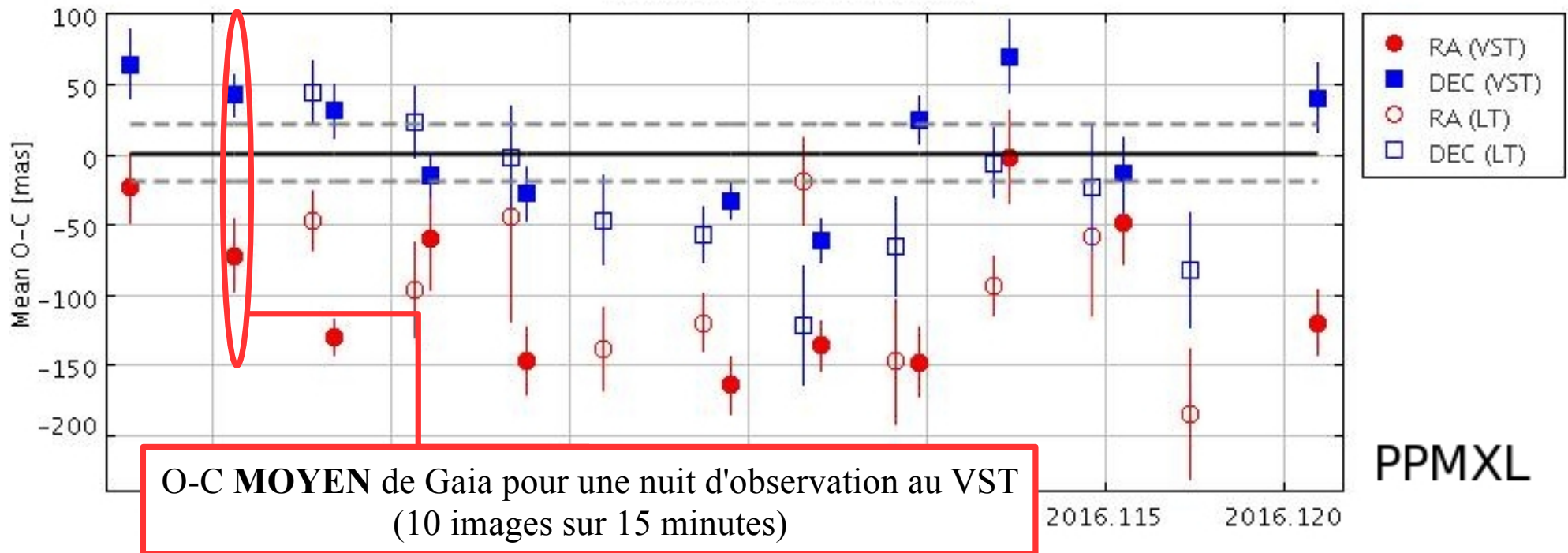
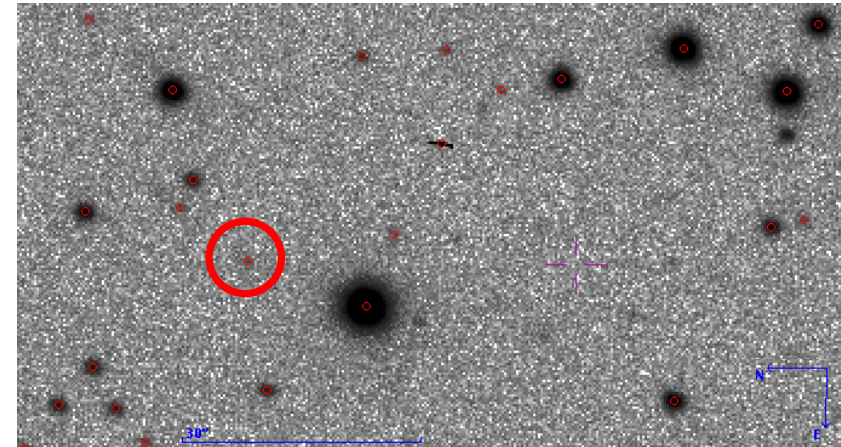


Image LT 22/07/2014

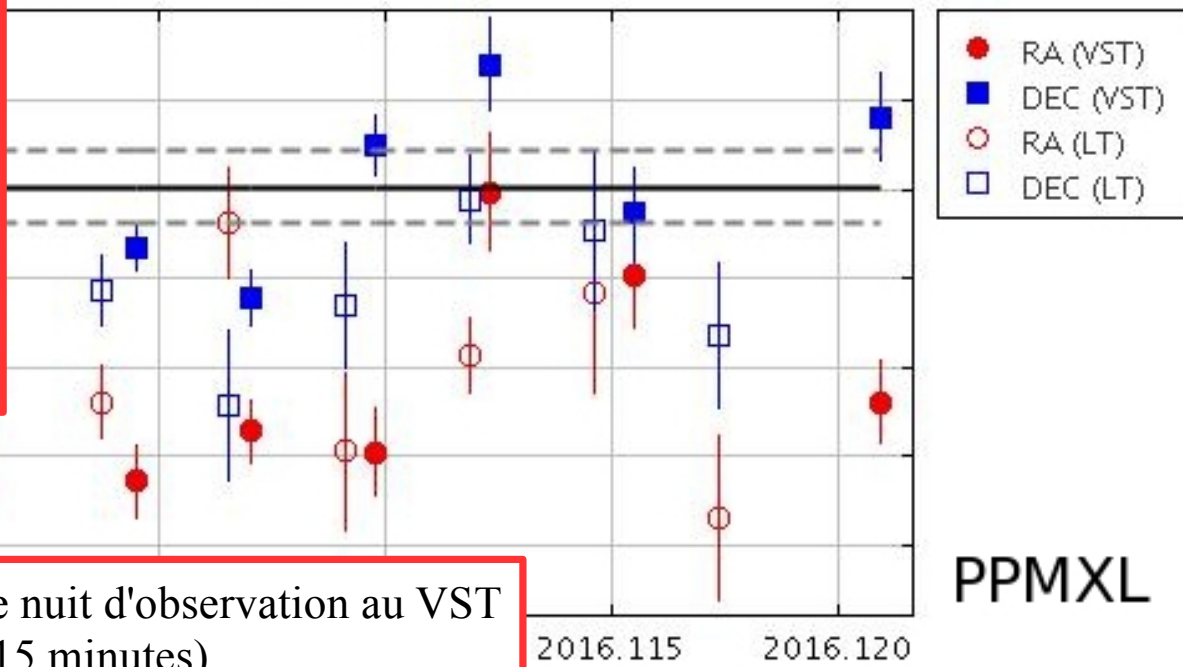
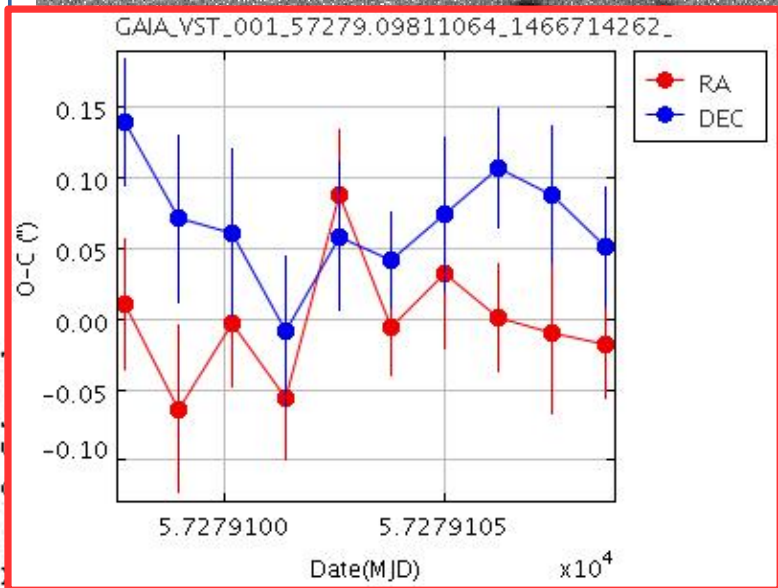
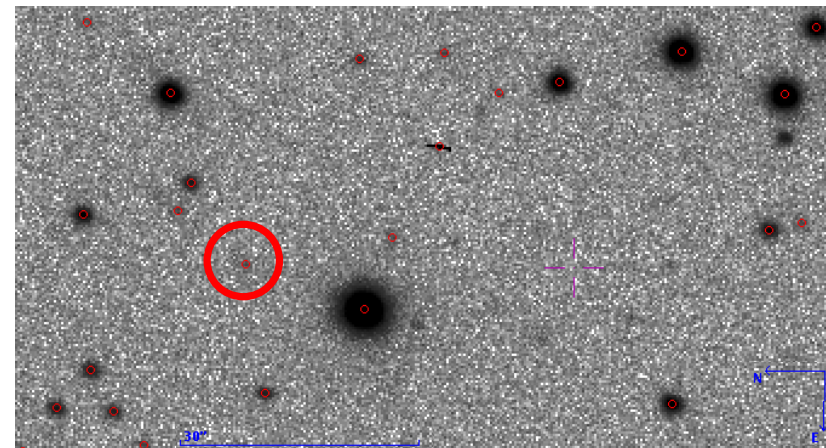
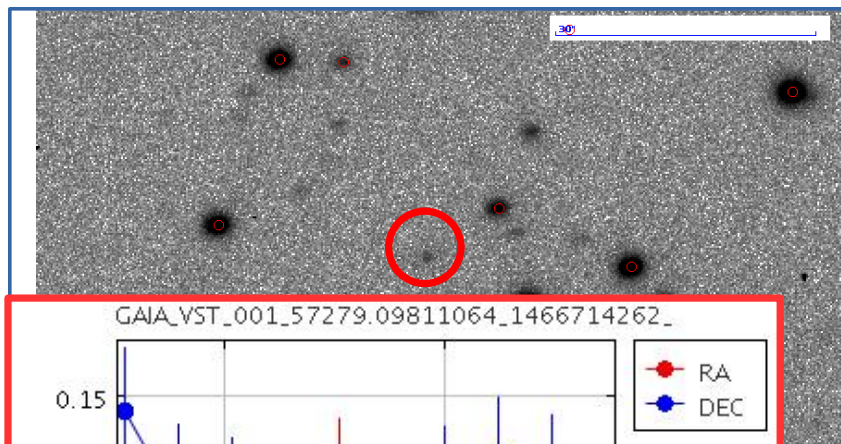


PPMXL / GAIA DR1

2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

Image LT 22/07/2014



O-C MOYEN de Gaia pour une nuit d'observation au VST
(10 images sur 15 minutes)

PPMXL

PPMXL / GAIA DR1

2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

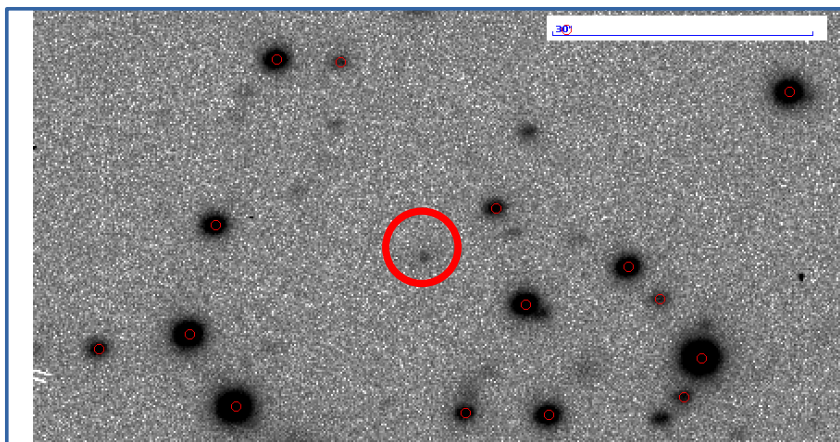
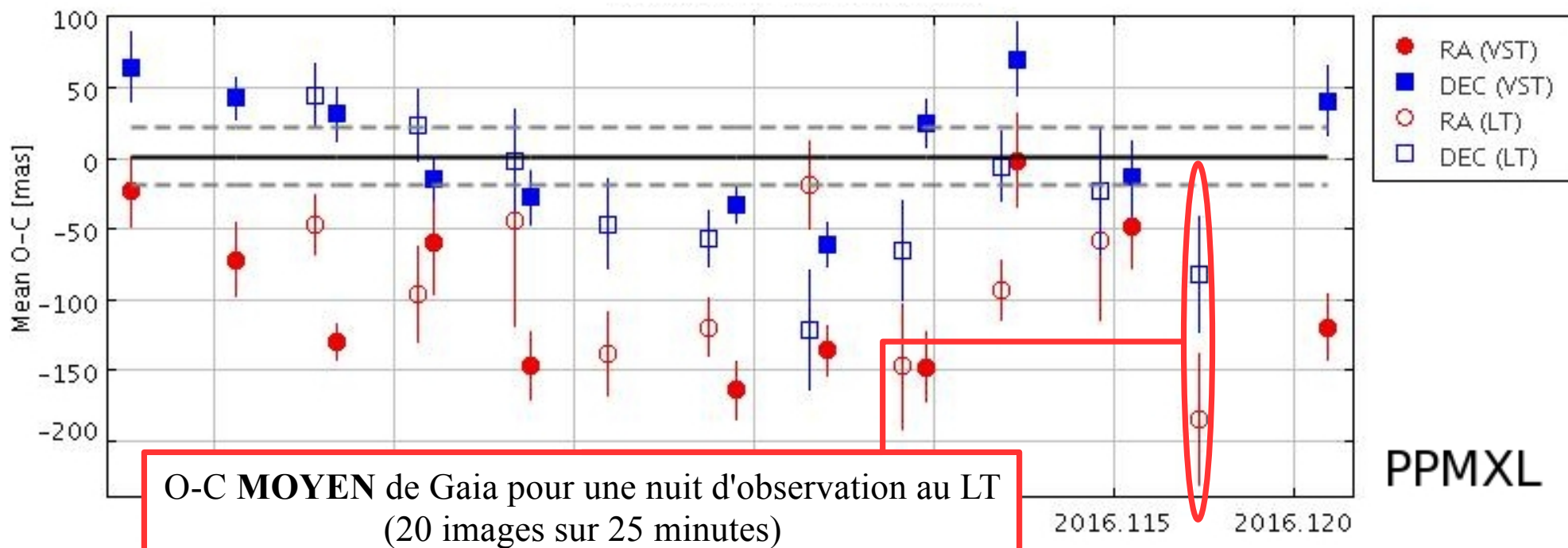
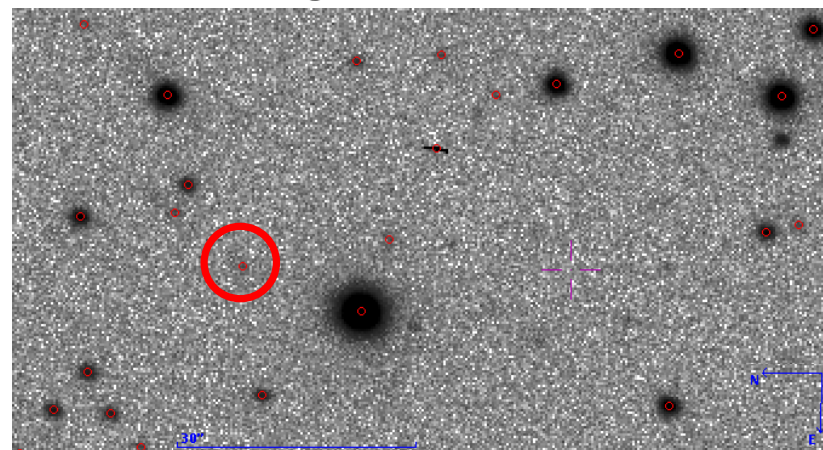


Image LT 22/07/2014



PPMXL / GAIA DR1
2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

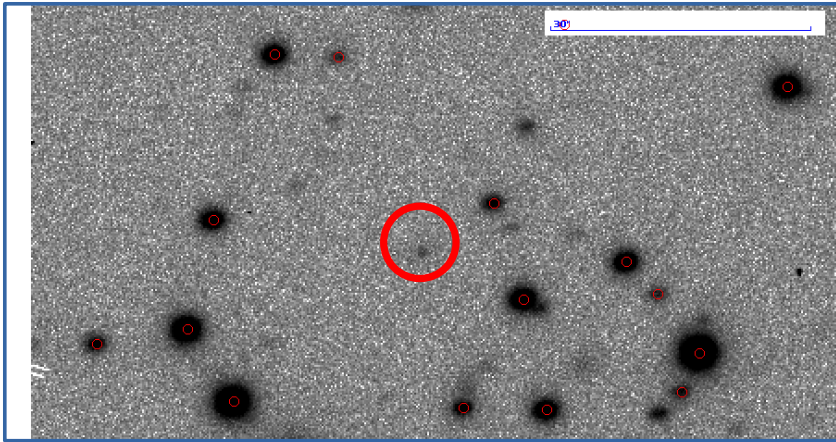
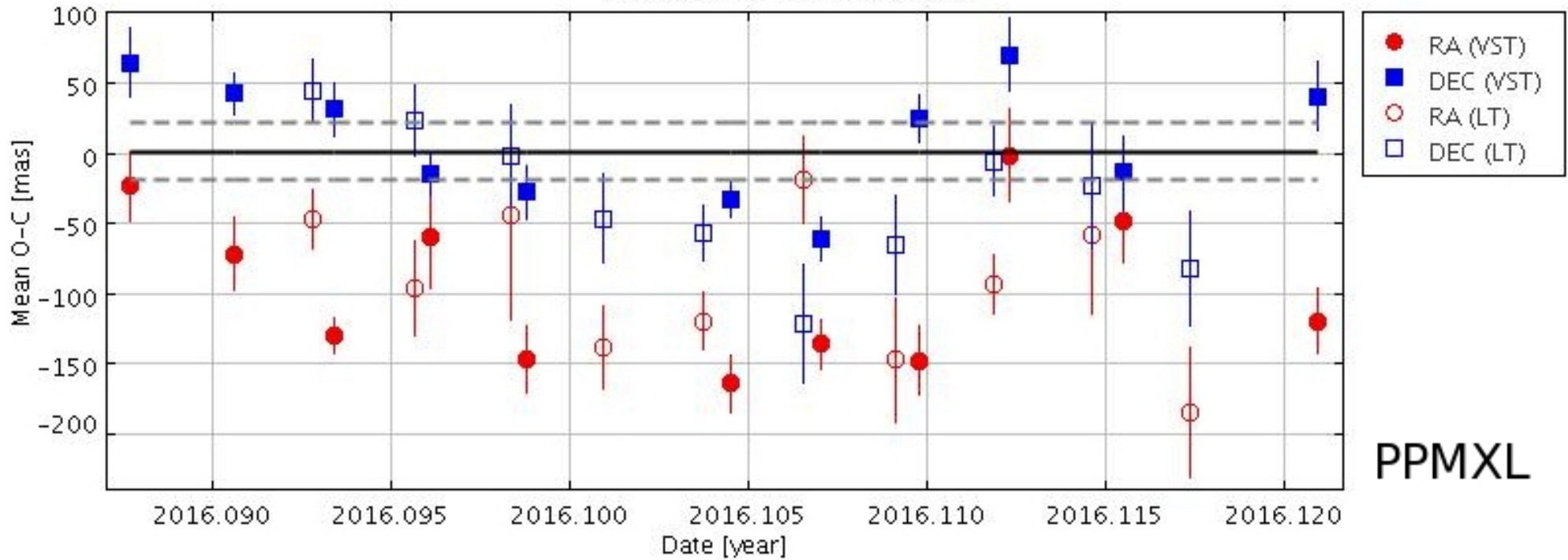
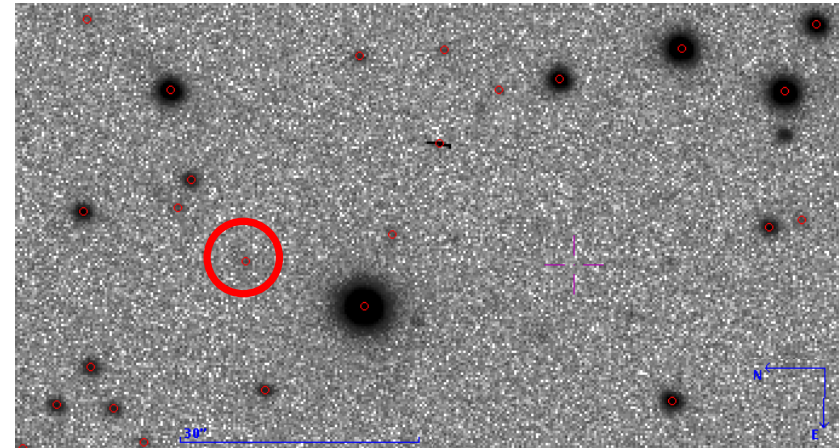


Image LT 22/07/2014



PPMXL / GAIA DR1
2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

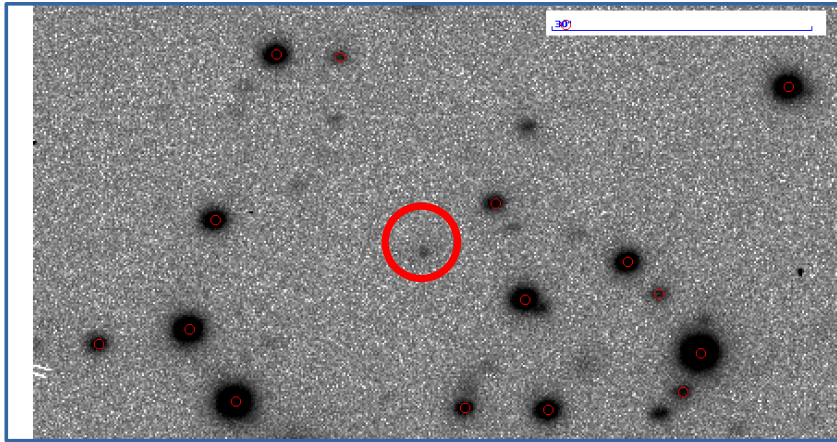
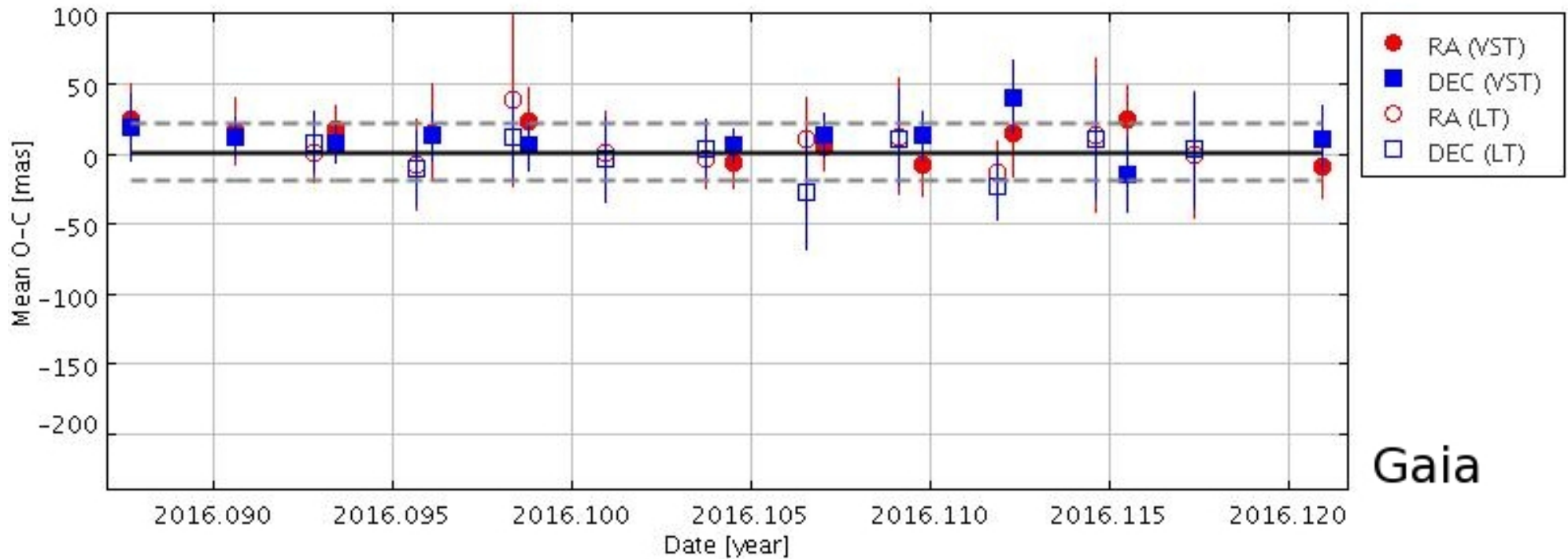
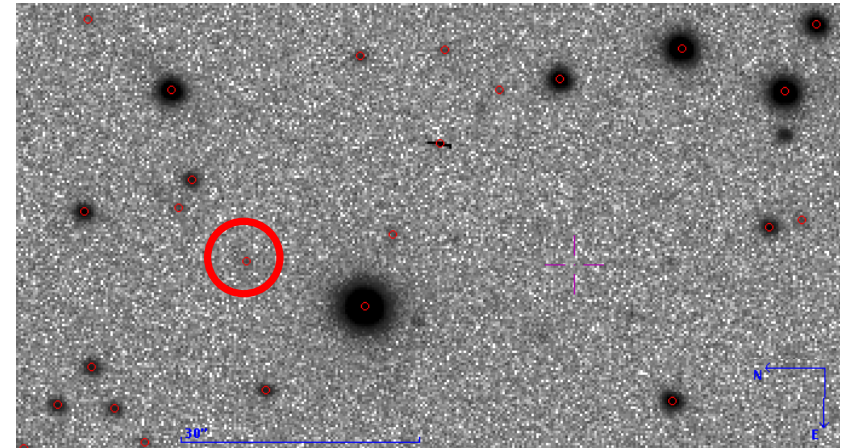


Image LT 22/07/2014



Gaia

PPMXL / GAIA DR1
2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

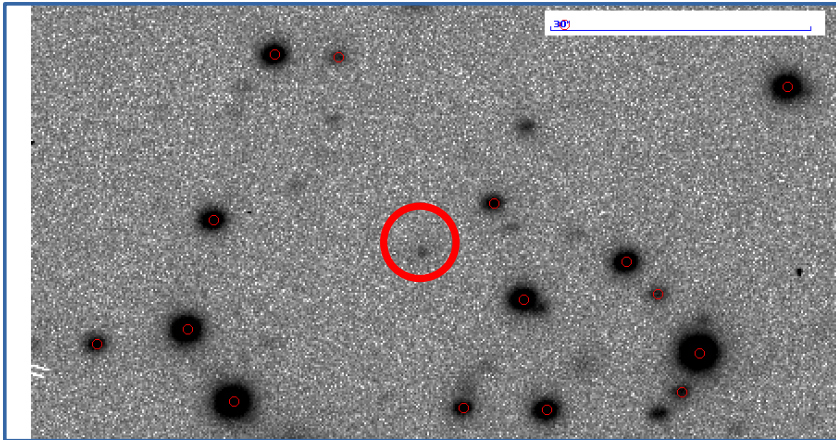
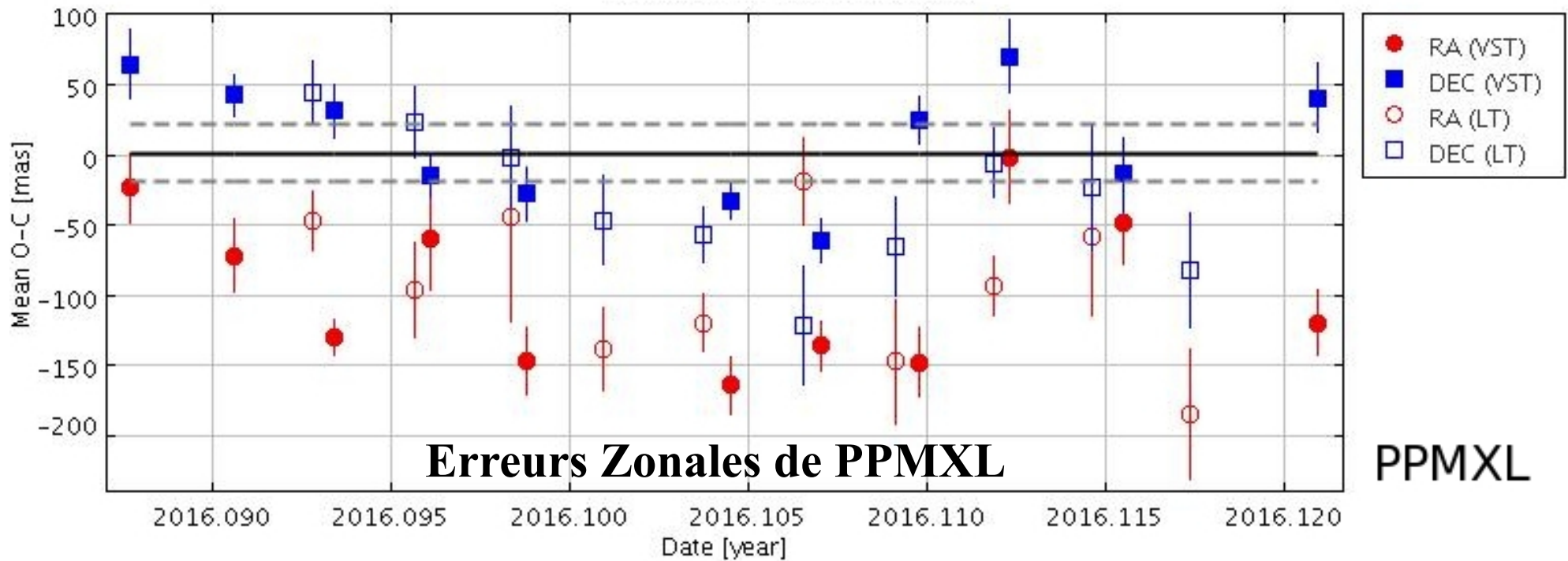
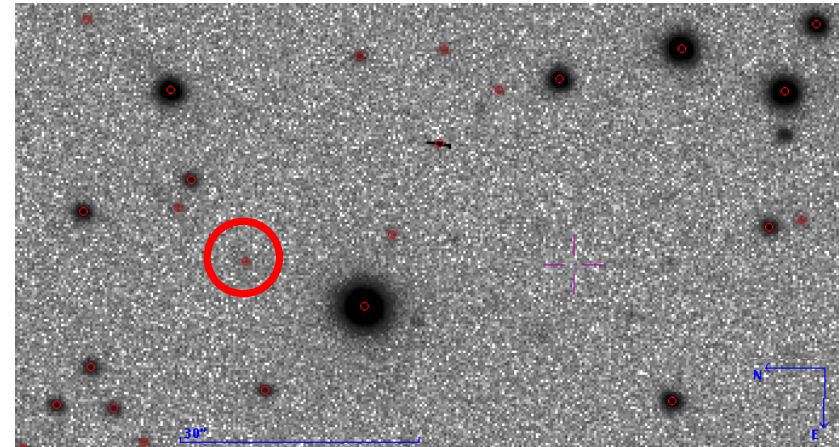


Image LT 22/07/2014



PPMXL / GAIA DR1
2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

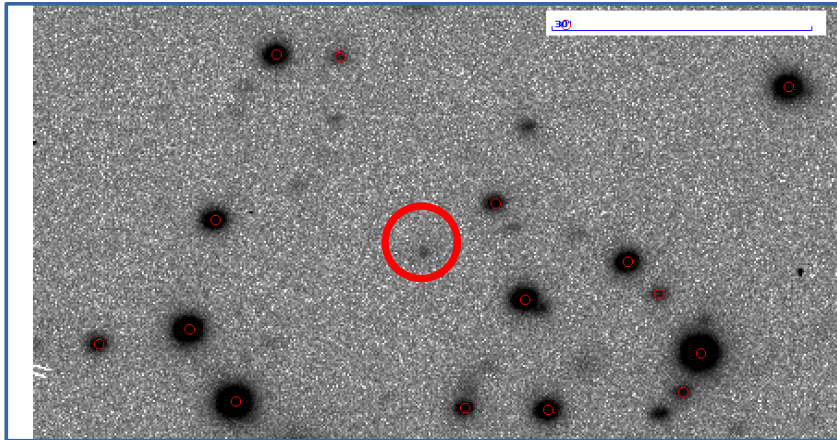
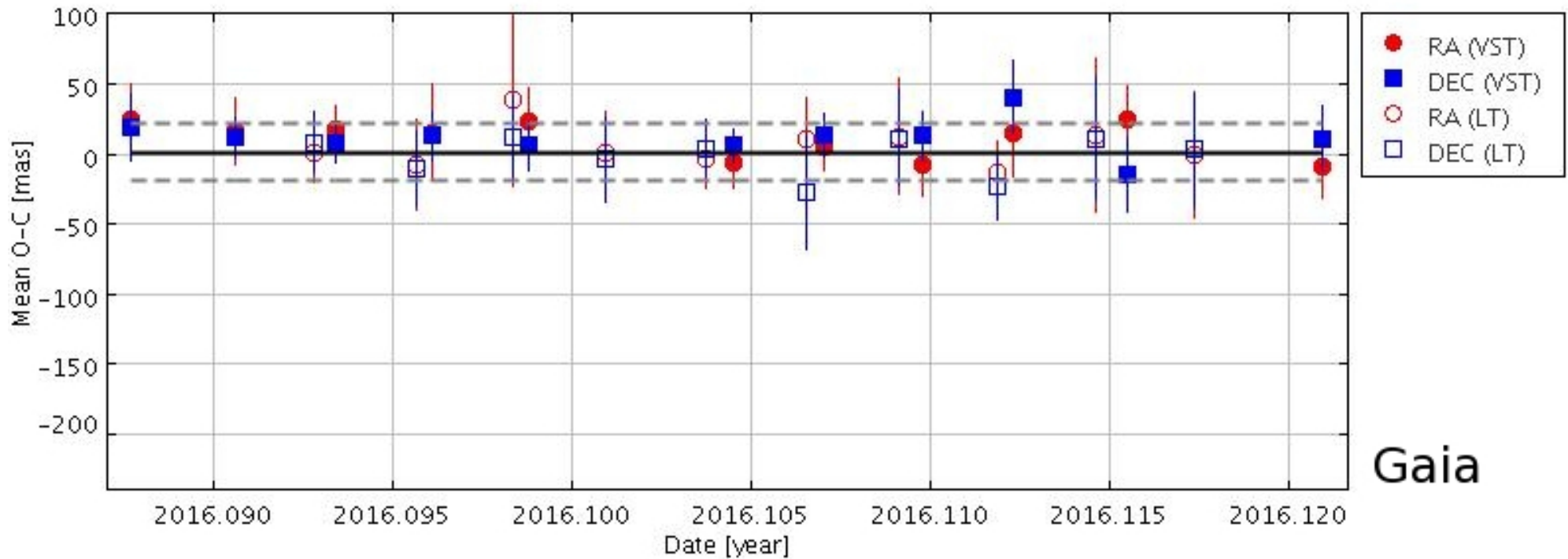
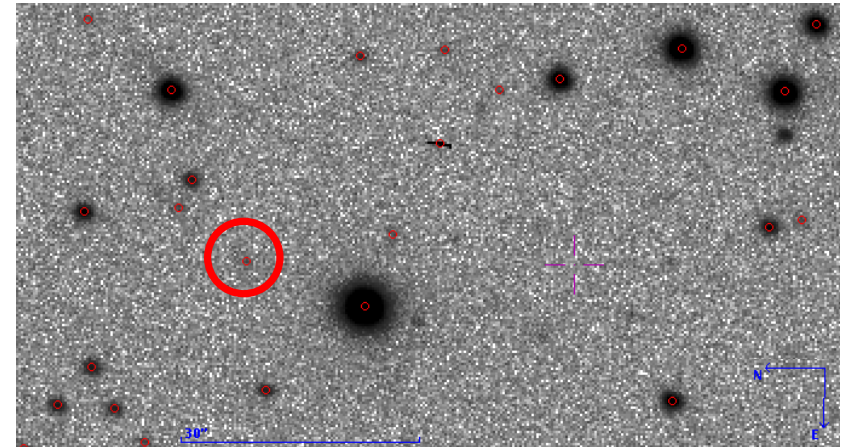


Image LT 22/07/2014



PPMXL / GAIA DR1
2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

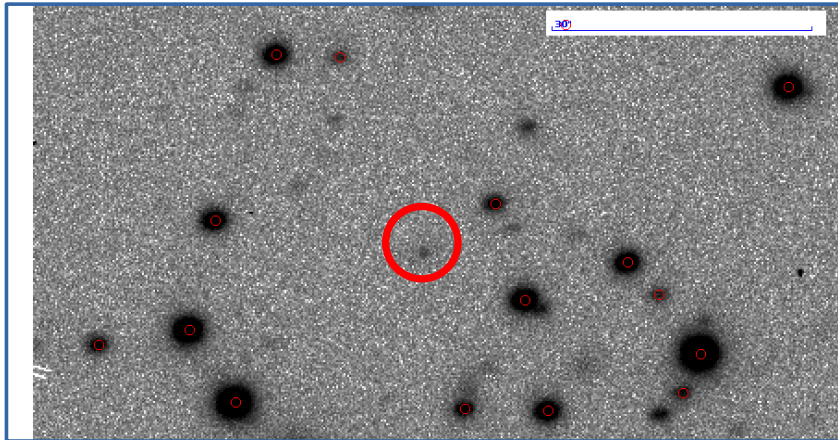
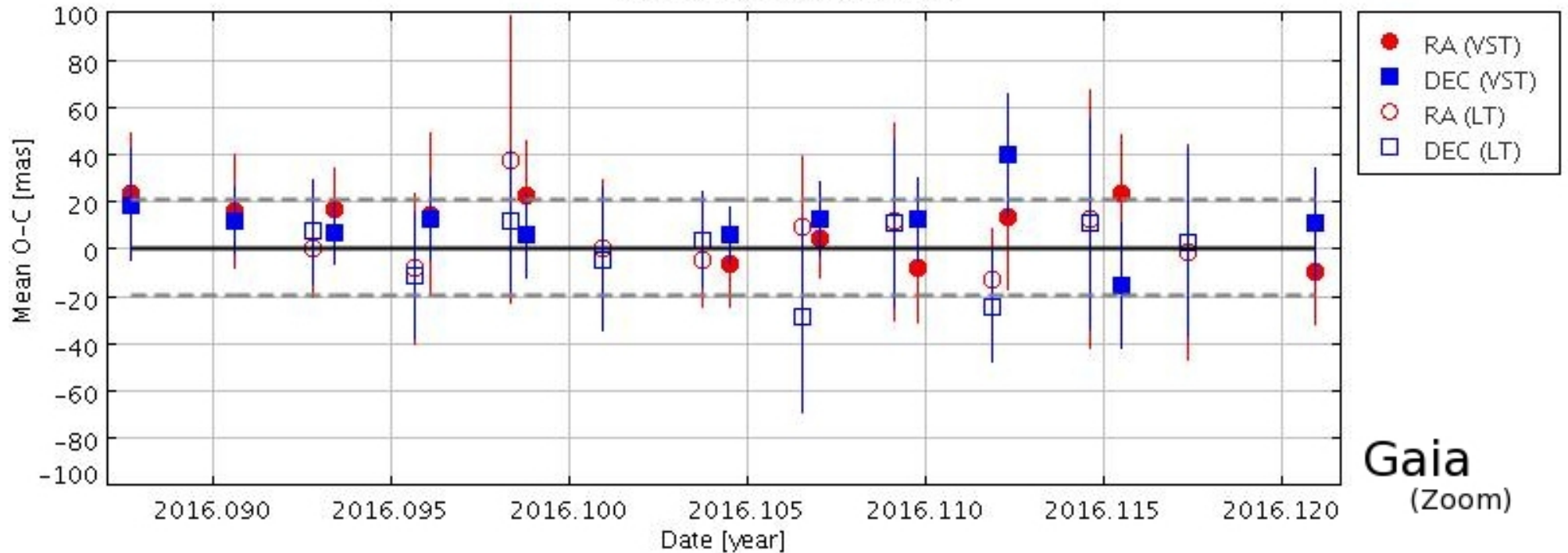
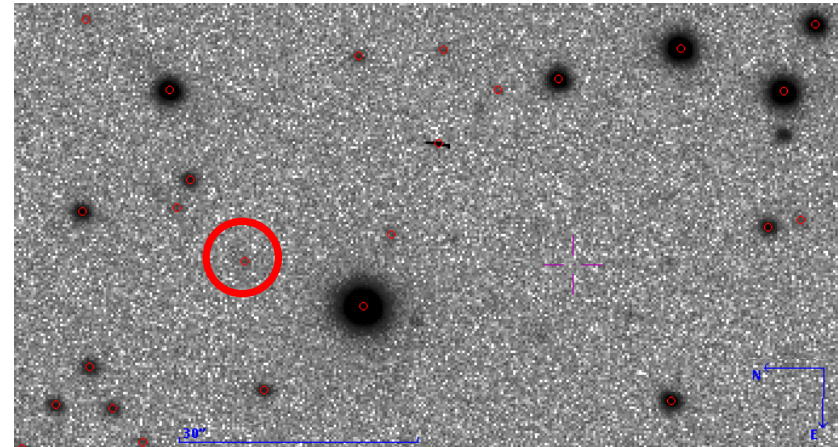


Image LT 22/07/2014



PPMXL / GAIA DR1
2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

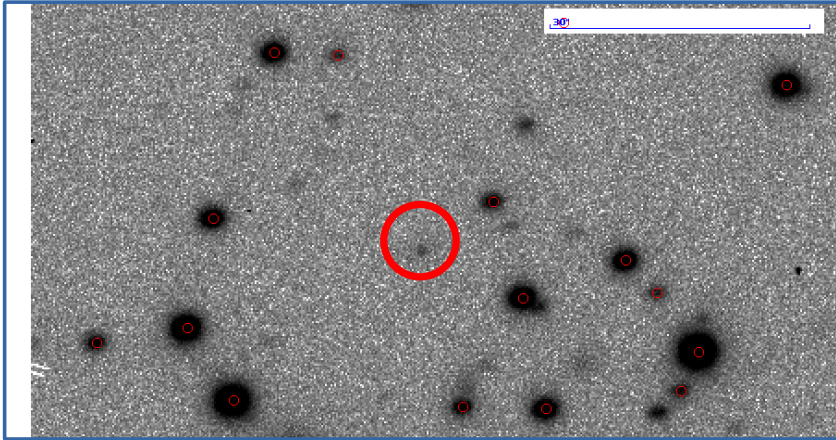
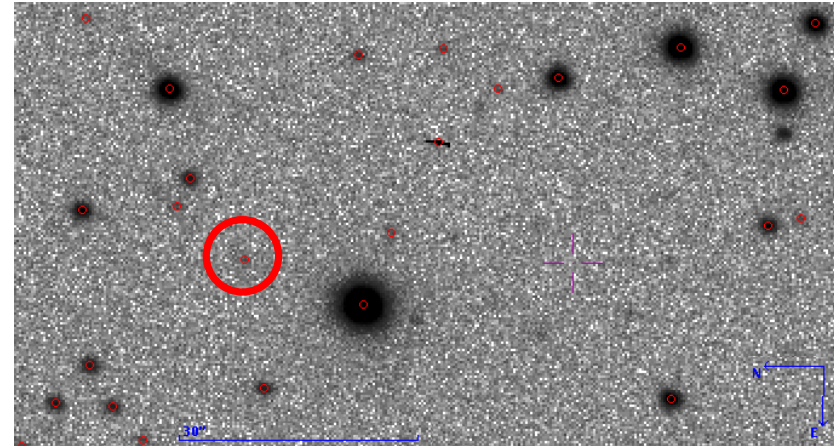


Image LT 22/07/2014



Un deuxième exemple ...

PPMXL / GAIA DR1

2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

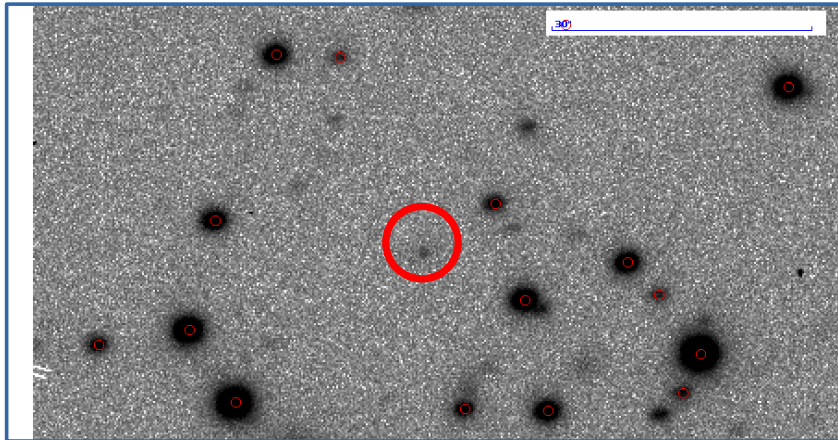
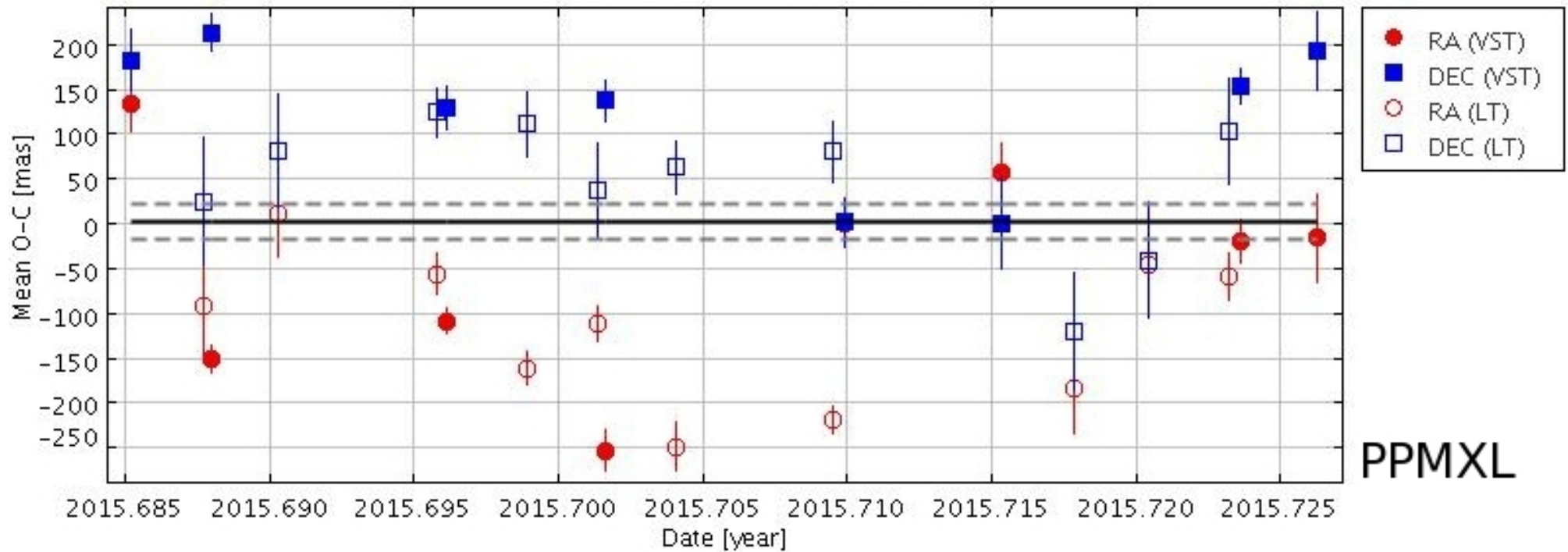
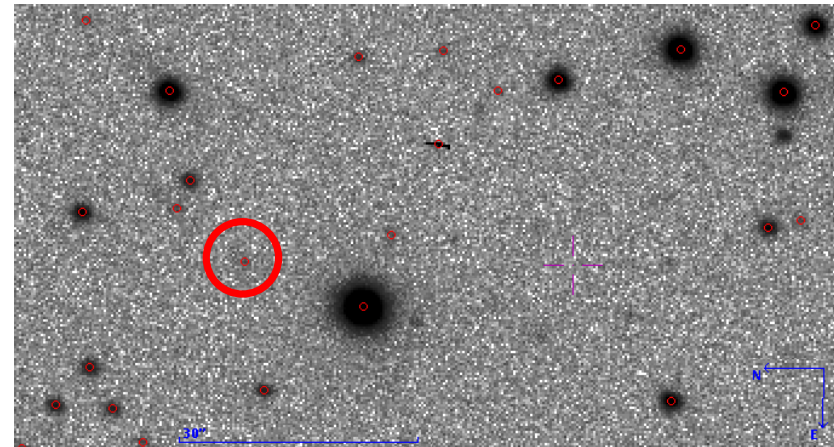


Image LT 22/07/2014



PPMXL / GAIA DR1
2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

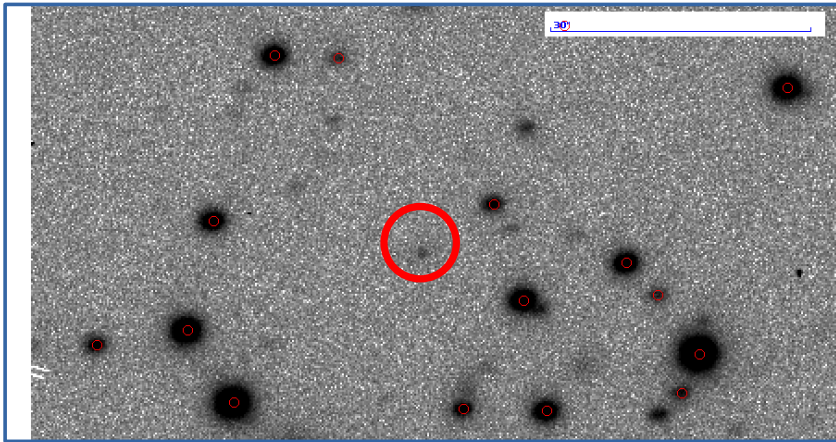
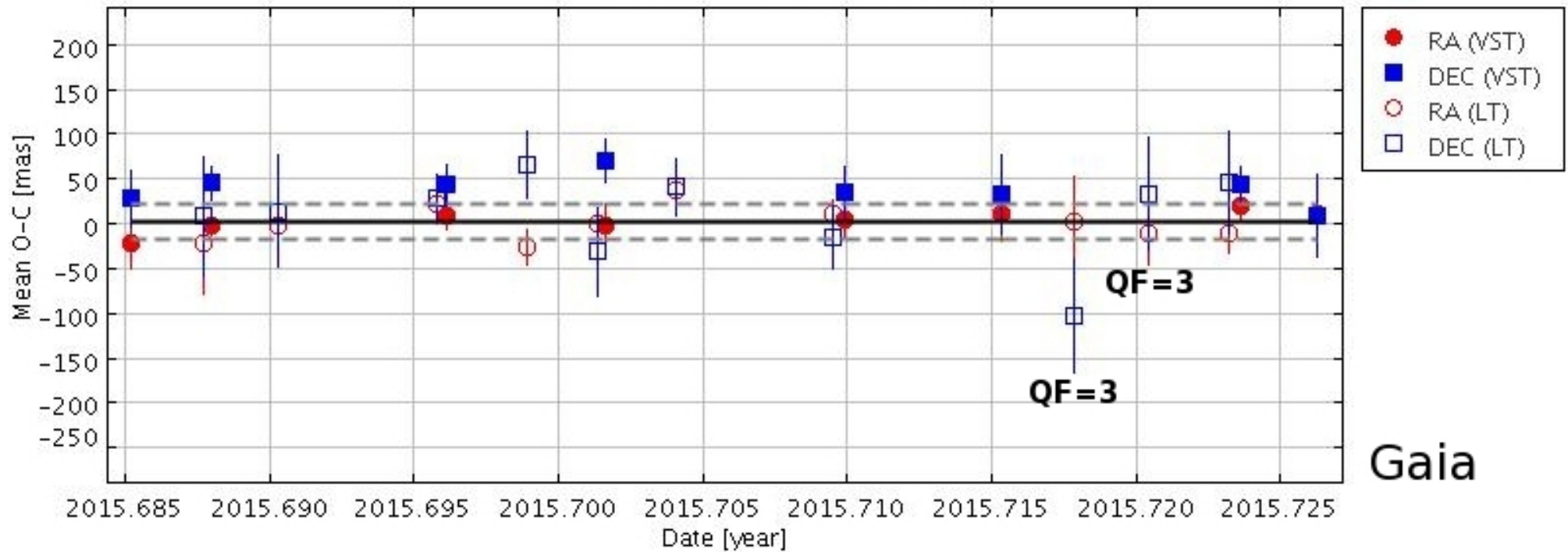
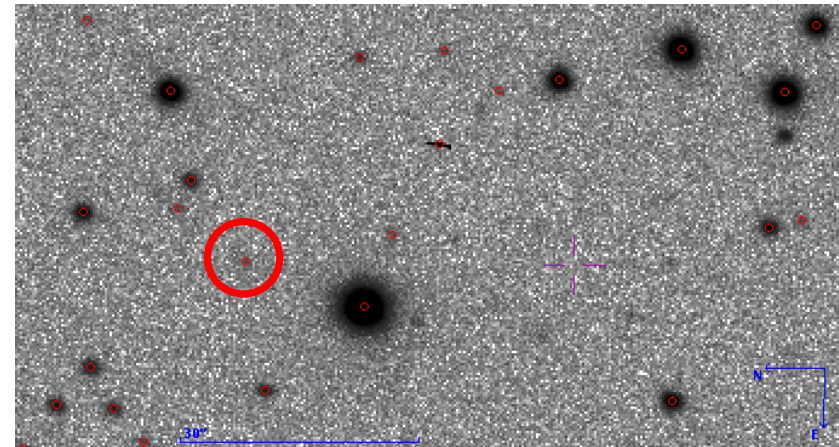


Image LT 22/07/2014



PPMXL / GAIA DR1
2 – Position de Gaia

Image VST (CCD n° 12) 22/07/2014

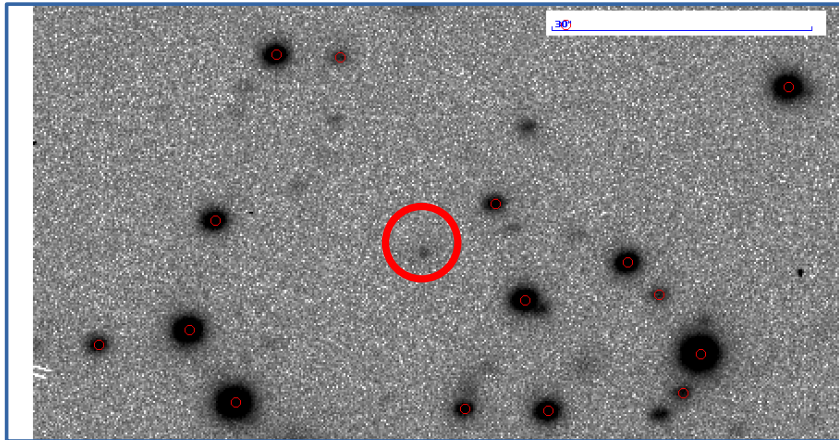


Image LT 22/07/2014

