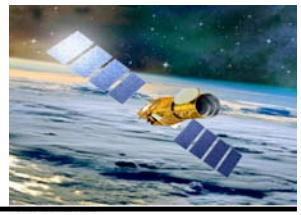
CoRoT *From stars to habitable planets*

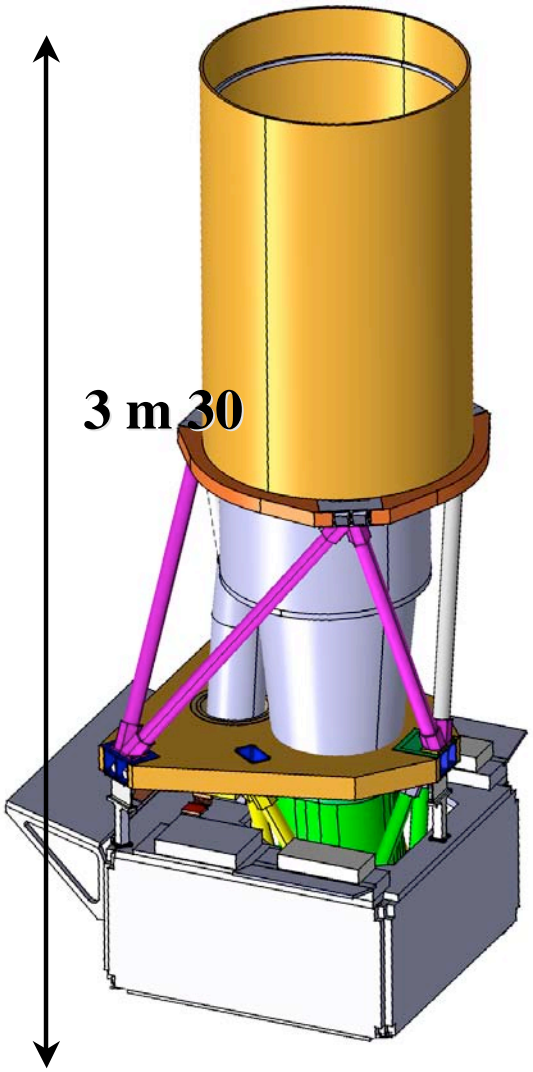
General presentation
Scientific and technical
Organisation

http://corot.oamp.fr

KASC Kick-off meeting, IAS Orsay october 29th 2007

The instrument



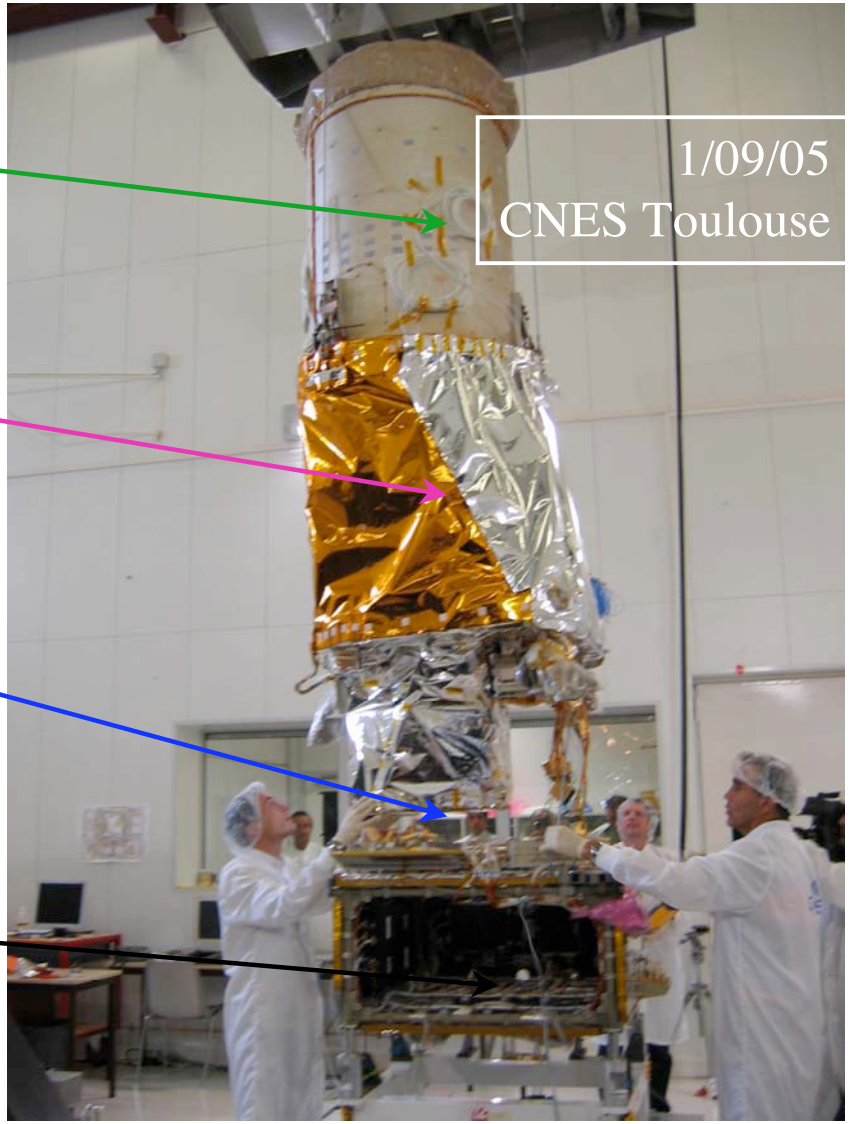


Very efficient Baffle
~ 1 photon over 10^{12}

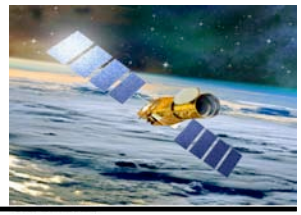
Afocal Telescope :
diameter 27 cm
Field : 7 square degrees

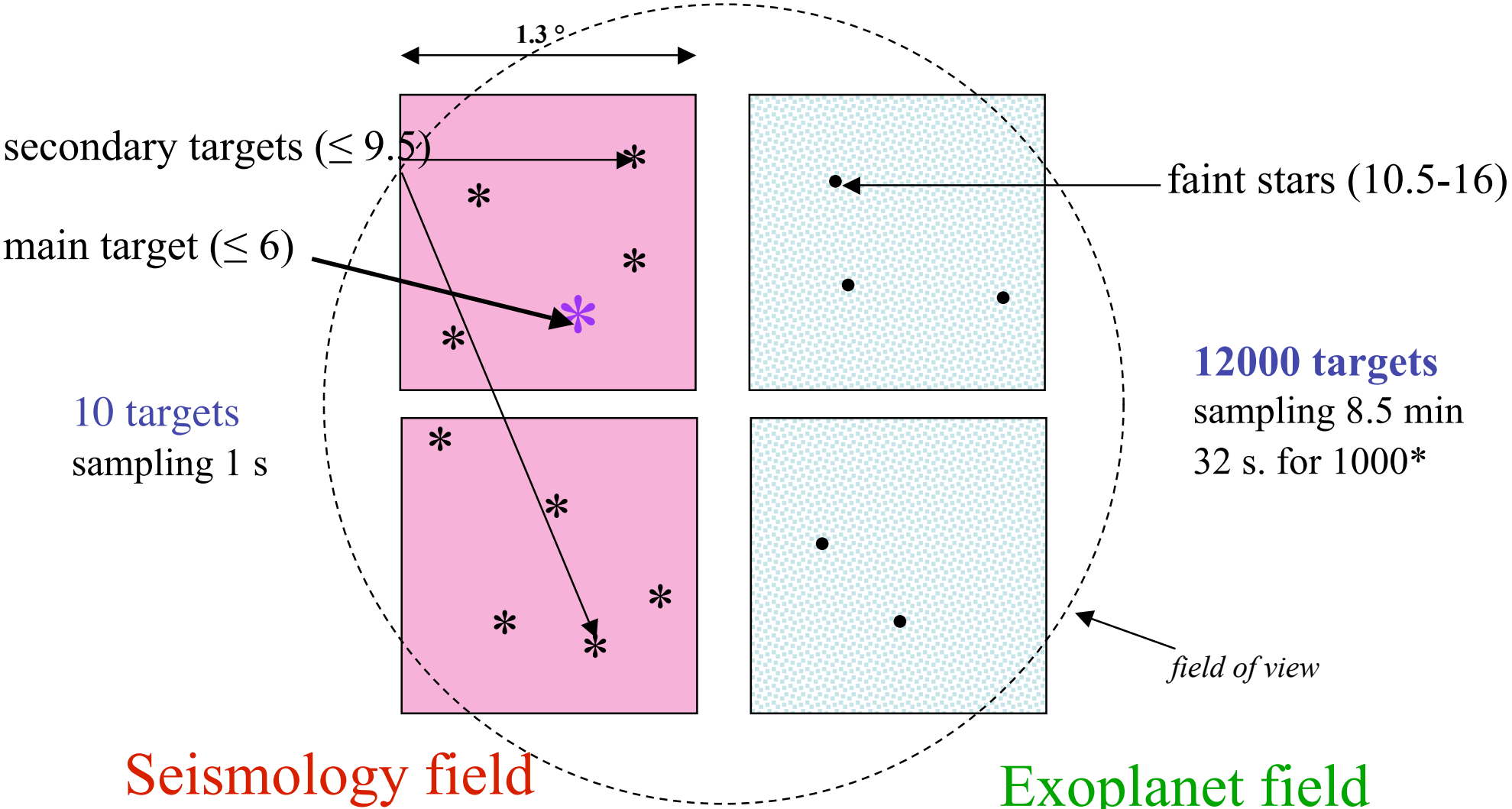
Camera:
4 detectors CCD
2000x2000 pixels
2 for each program

Servide module
(électronics)

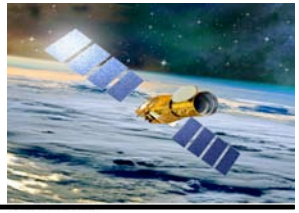


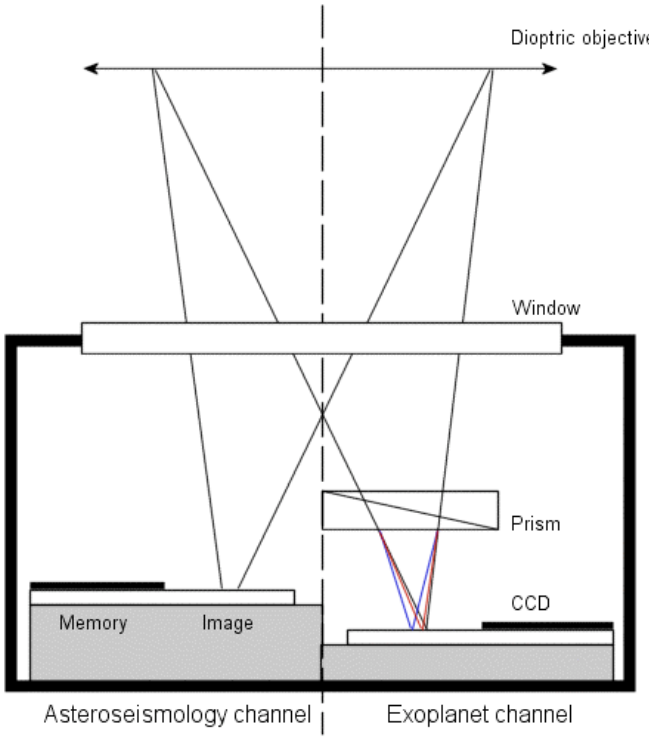
The focal plane



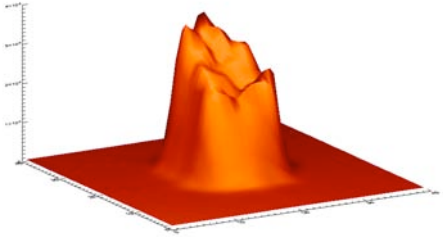


Spot images



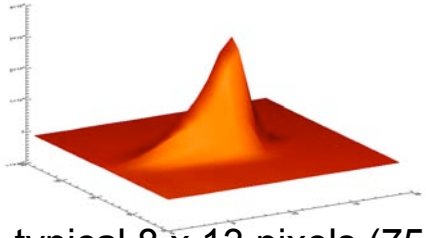


seismology



400 to 300 pixels

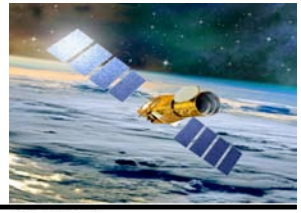
exoplanet



typical 8 x 13 pixels (75 pixels)

Depending on the magnitude the surface is 120 to 40 px.

On board aperture photometry



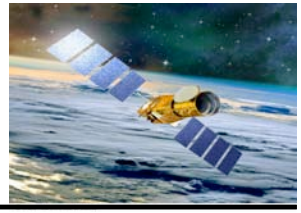
$$F(t)=\Sigma[(\ \text{star}\ -\ \text{background}\ )\times\ \text{aperture}\ ]$$

- Compute the average offset
- Compute the mean background and substract the offset
- Substraction of the offset and background to the star image and summation of all pixels in the aperture.

Output of the on board software: Sismofield sampling 1 s.

Exoplanet field, sampling 32 s. or 512 s. stars and background.
Offset sampling 32 s.

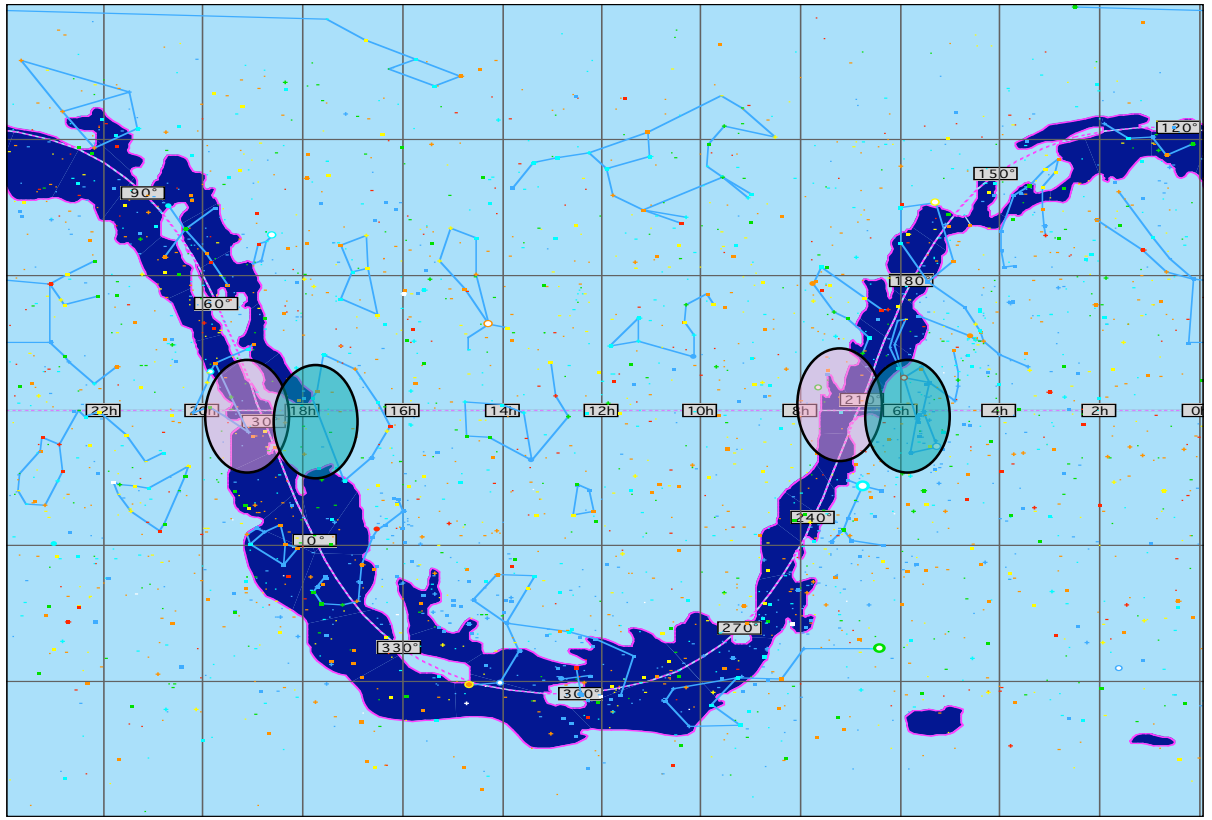
The orbit and the CoRoT Eyes



Fixed Directions
for the whole mission

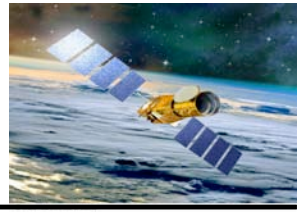
Polar Orbit

Altitude: 896 Km,
excentricity i= 90.02,
Ω= 15°,
Orbital period= 6184s.

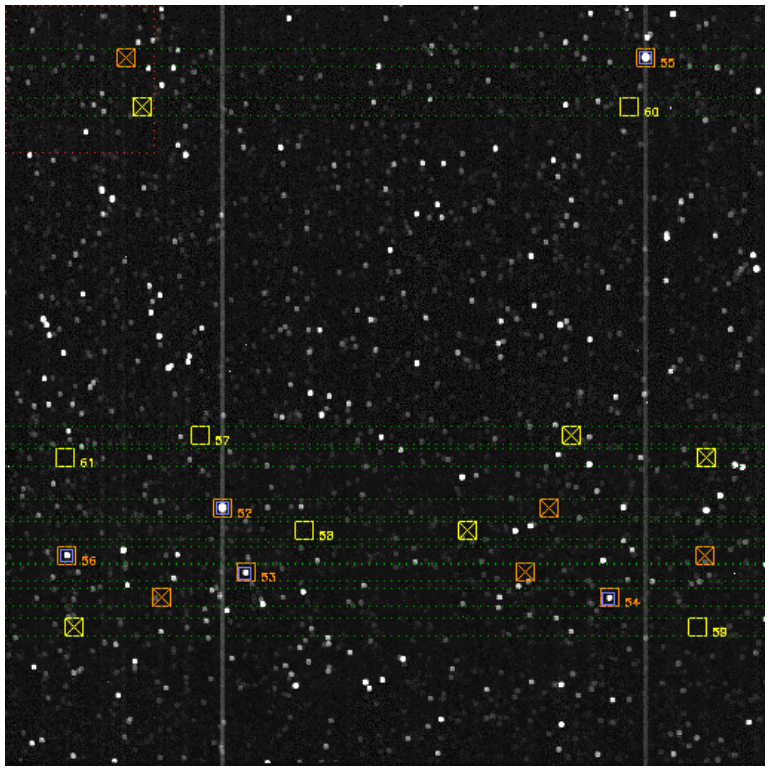


And drift….next year

The instrument in flight

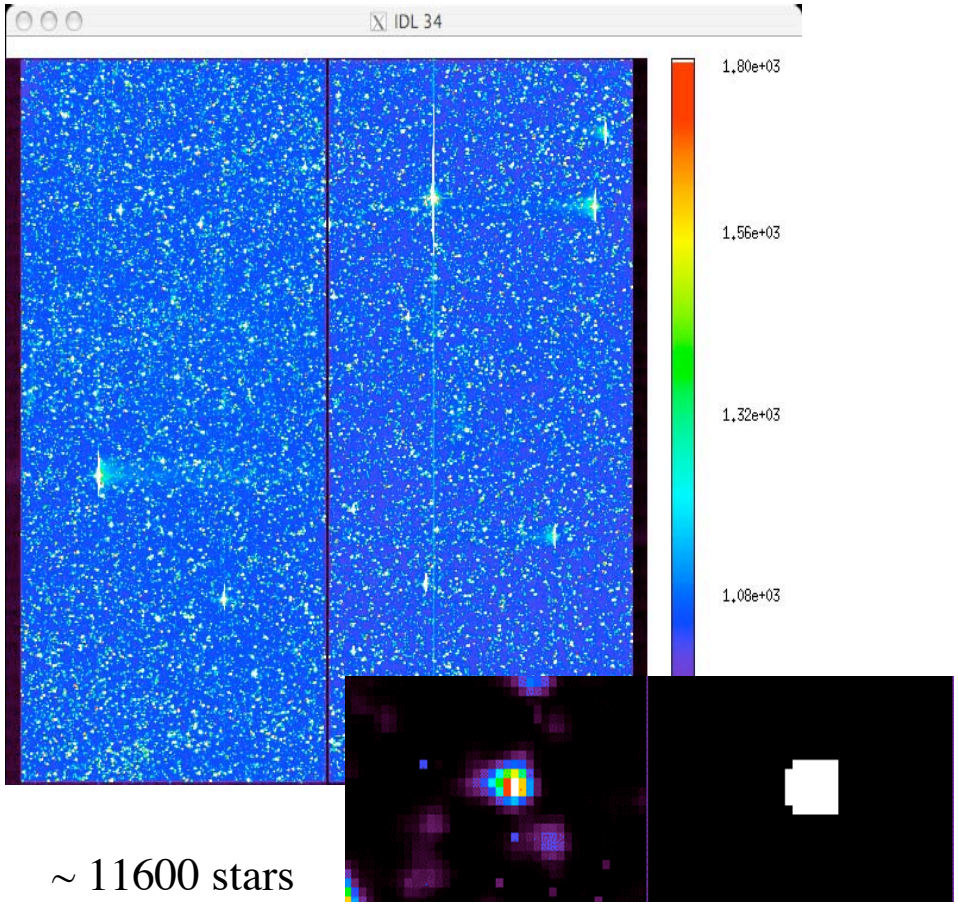


Seismology channel



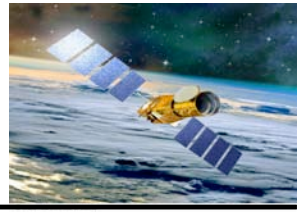
- 10 bright stars
- 10 sky background windows.

Exoplanet channel



- ~ 11600 stars
- 400 sky background windows.

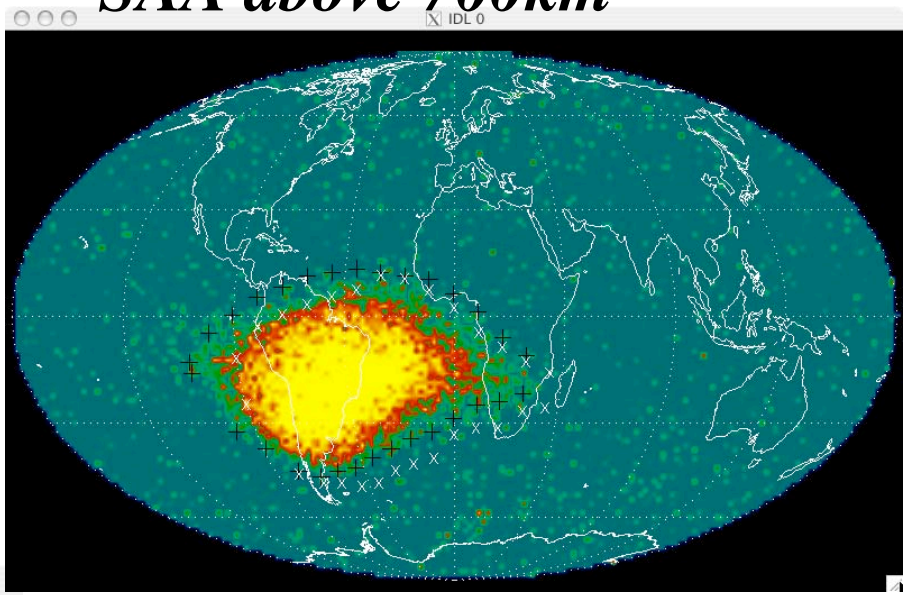
Duty cycle and length of a run

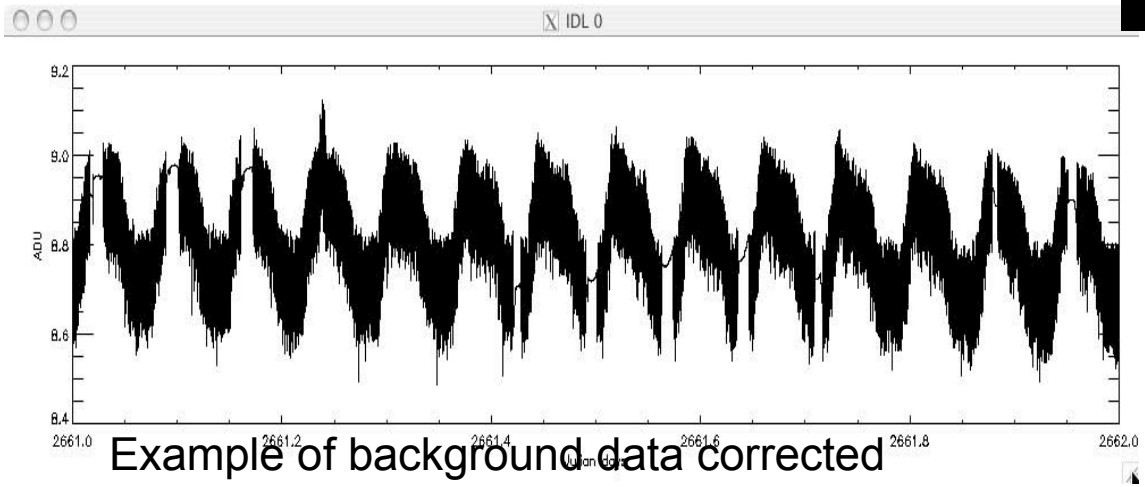


Runs

- IR01 80 d.
- SRc01 21d.
- LRc01 150 d.
- LRa01 ……
- SRa01 NGC2264
- ……..

SAA above 700km





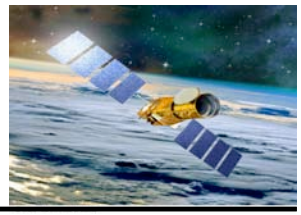
Example of background data corrected from the protons perturbations outside SAA

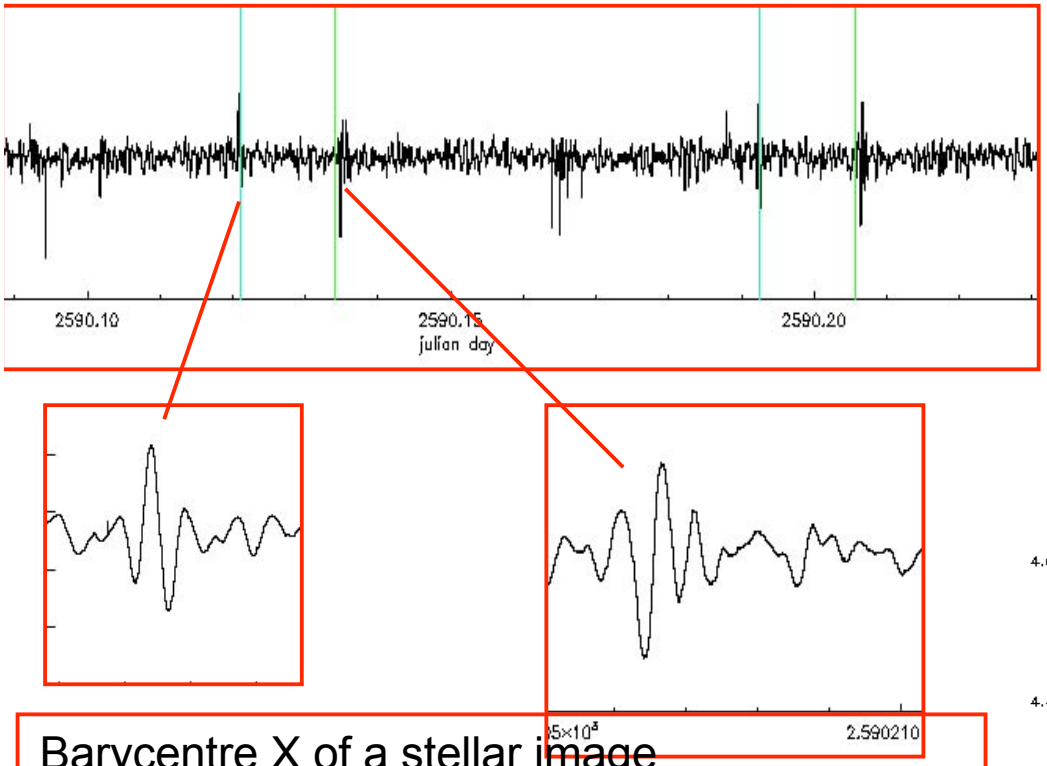
Data losses are mainly due to SAA crossing: 6%.

Others random events: 1 to 2%.

Duty cycle 92% (90 asked for).

Pointing stability





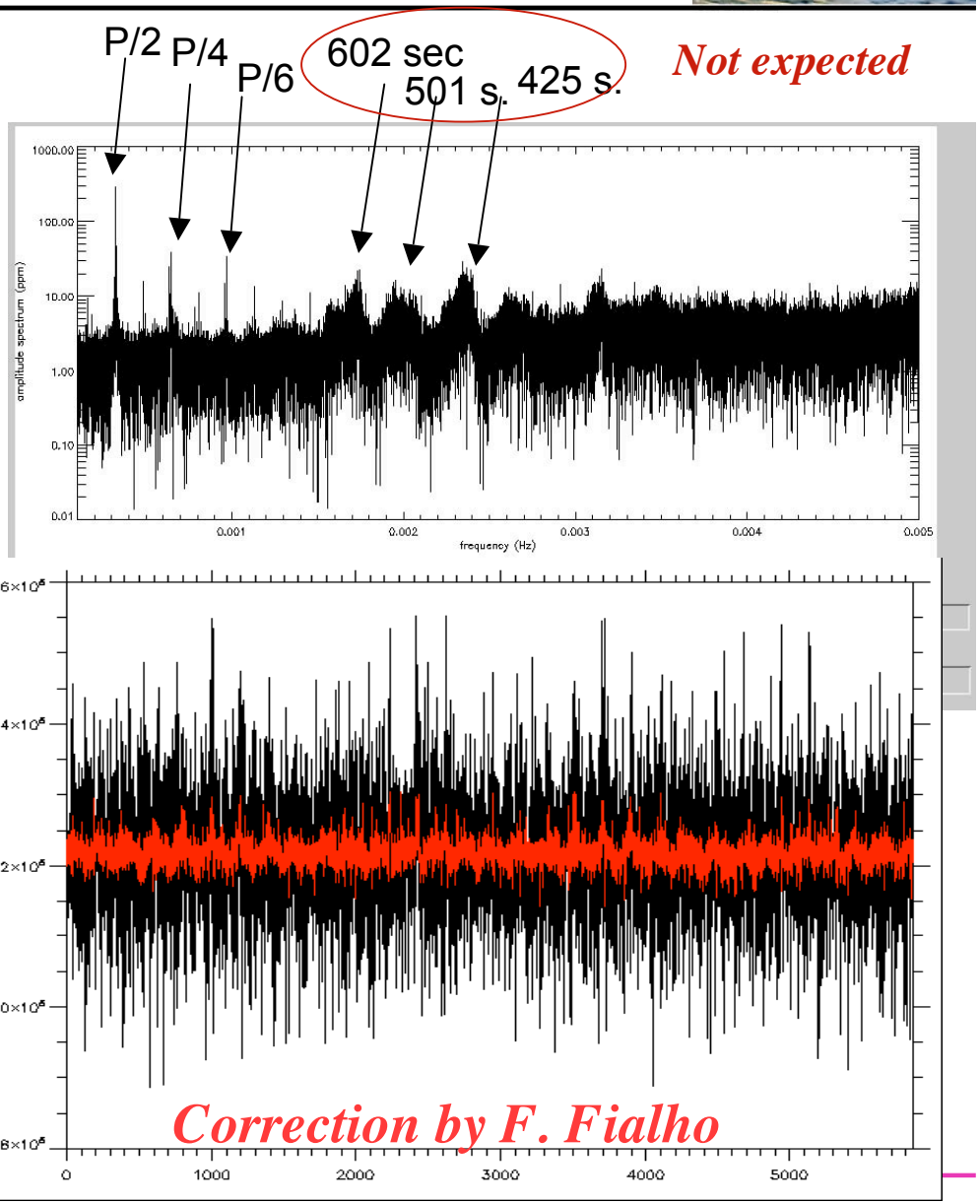
Barycentre X of a stellar image
Vibrations due to ingress/egress from eclipses

Stability Performances :

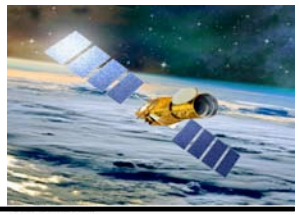
in x rms 0.12 pixel

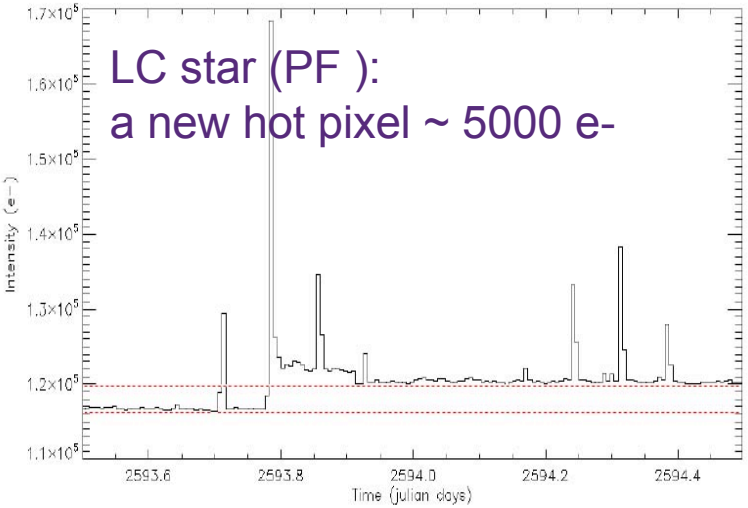
in y rms 0.15 pixel

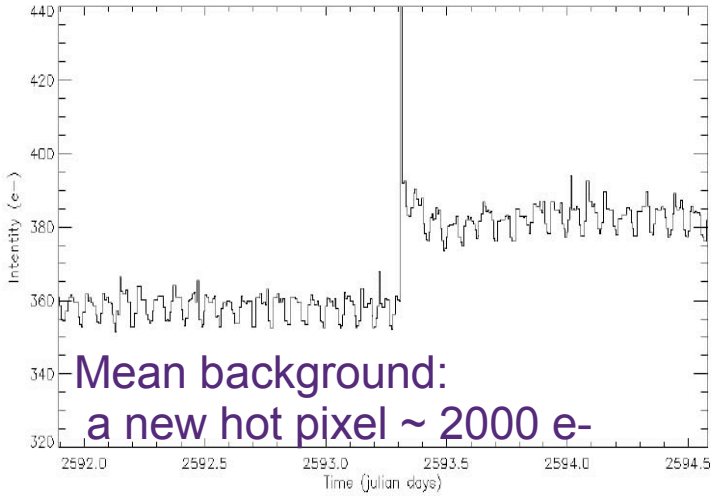
~ 0.3 sec. d'arc



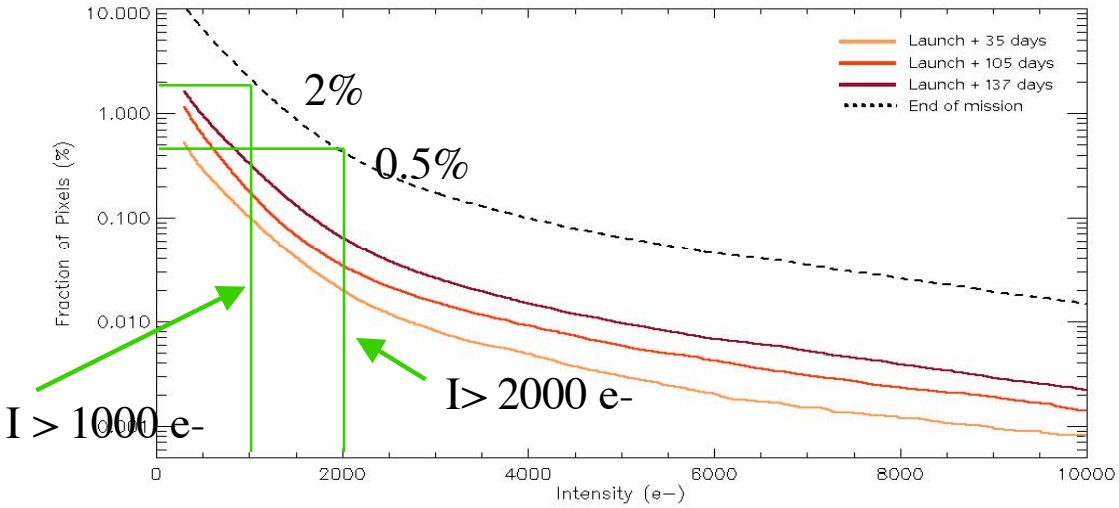
Hot pixels



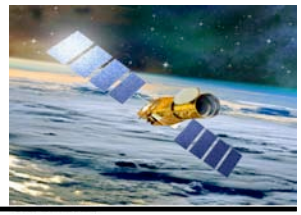




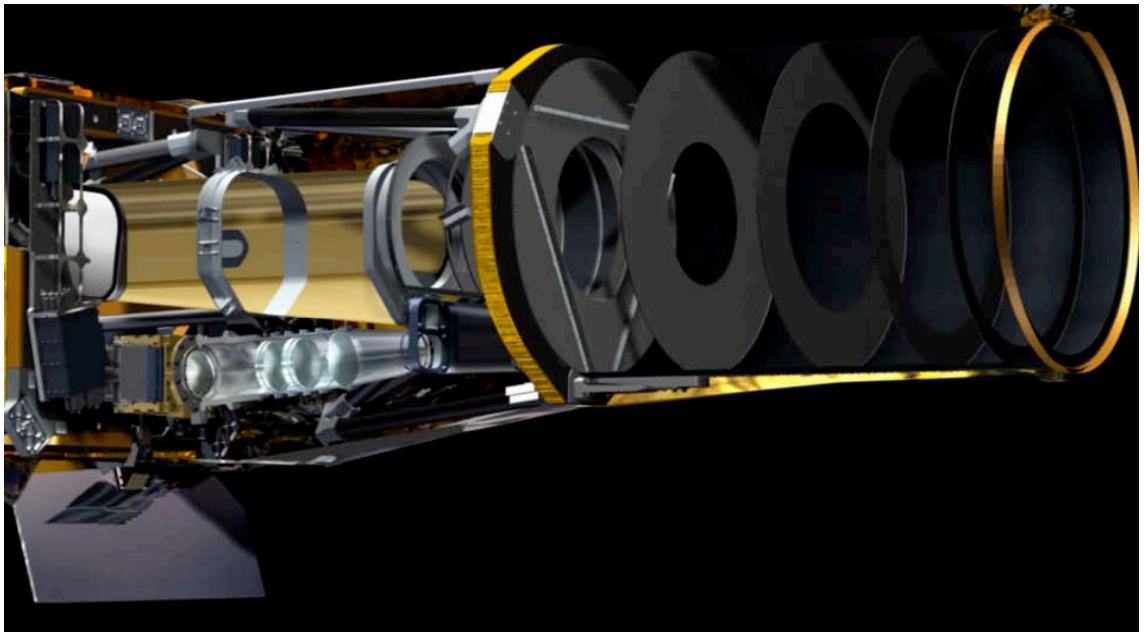
10 times more numerous than expected



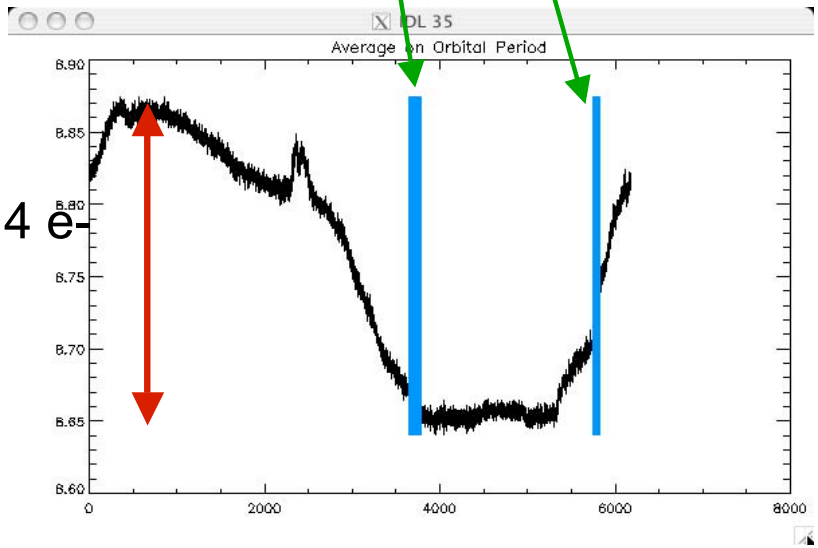
The fight against stray light



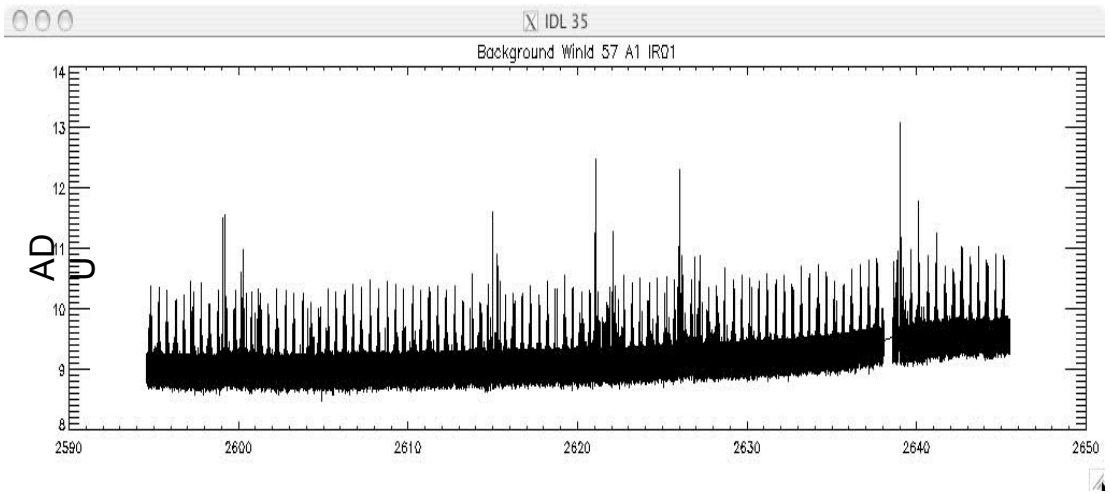
* The afocal telescope is off-axis.
easier to protect the focal plane against straylight
* The baffle has two stages…



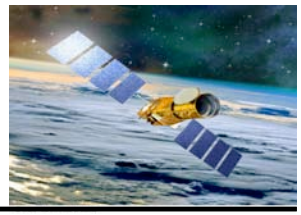
Eclipses
Ingress Egress



0.4 e-

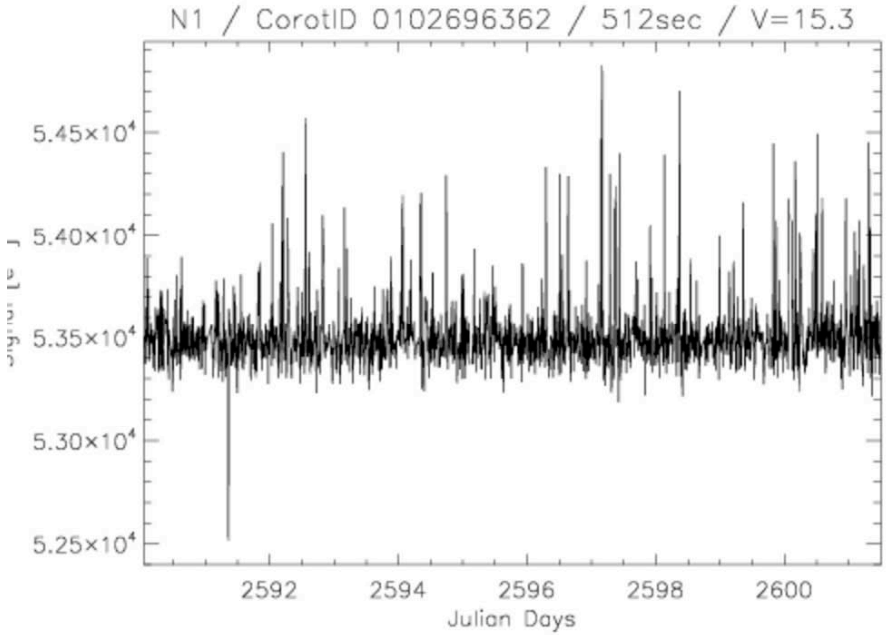


Photometric performances



EXO

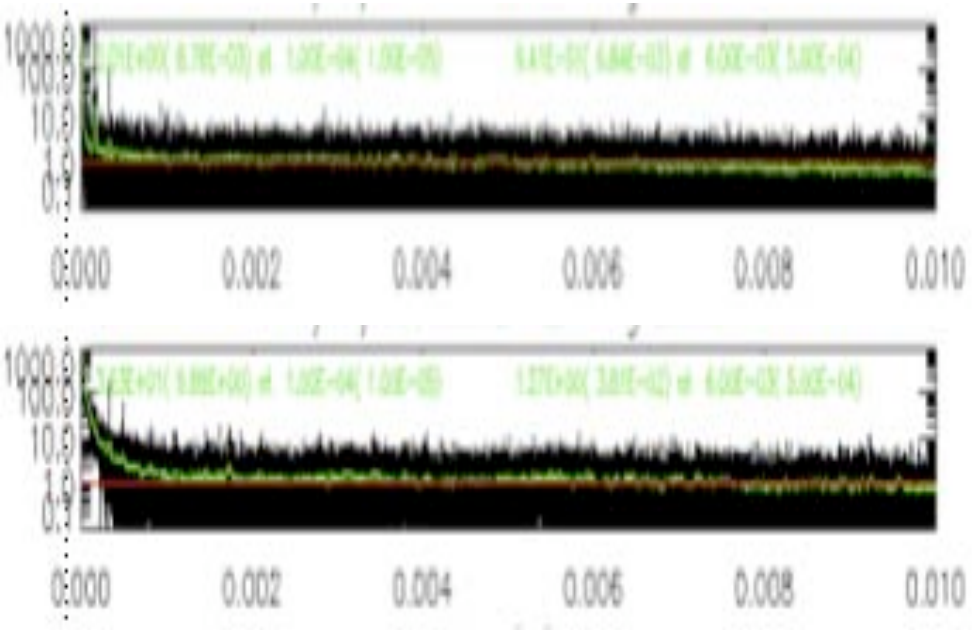
Spec: 7 10^{-4} en 1h m_v=15.5



mv= 15.4 Integration time 1h.
rms noise 700 ppm
mv=12.3 Integration time 1h.
rms noise 170 ppm

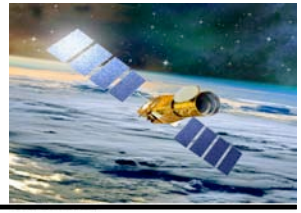
SISMO

Spec: Bruit haute fréquence (> 0.1mhz)
sur 5 jours, pour mv=5.7 0.6 ppm



Presently, with very rough corrections
mv = 5.4, 0.8 ppm
mv = 5.7, 0.9 ppm

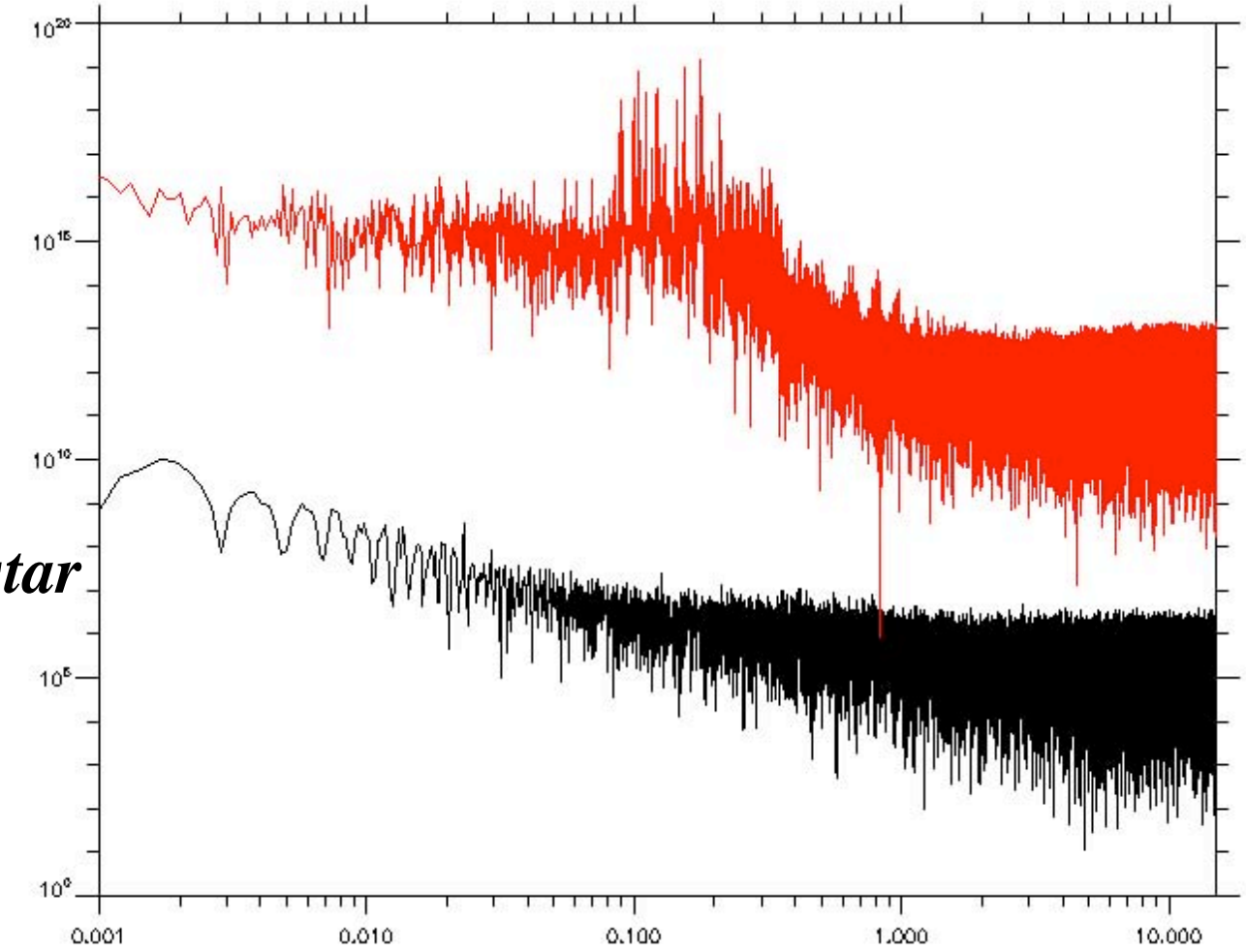
In the seismology field…



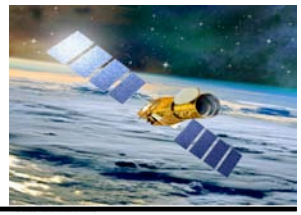
80 days

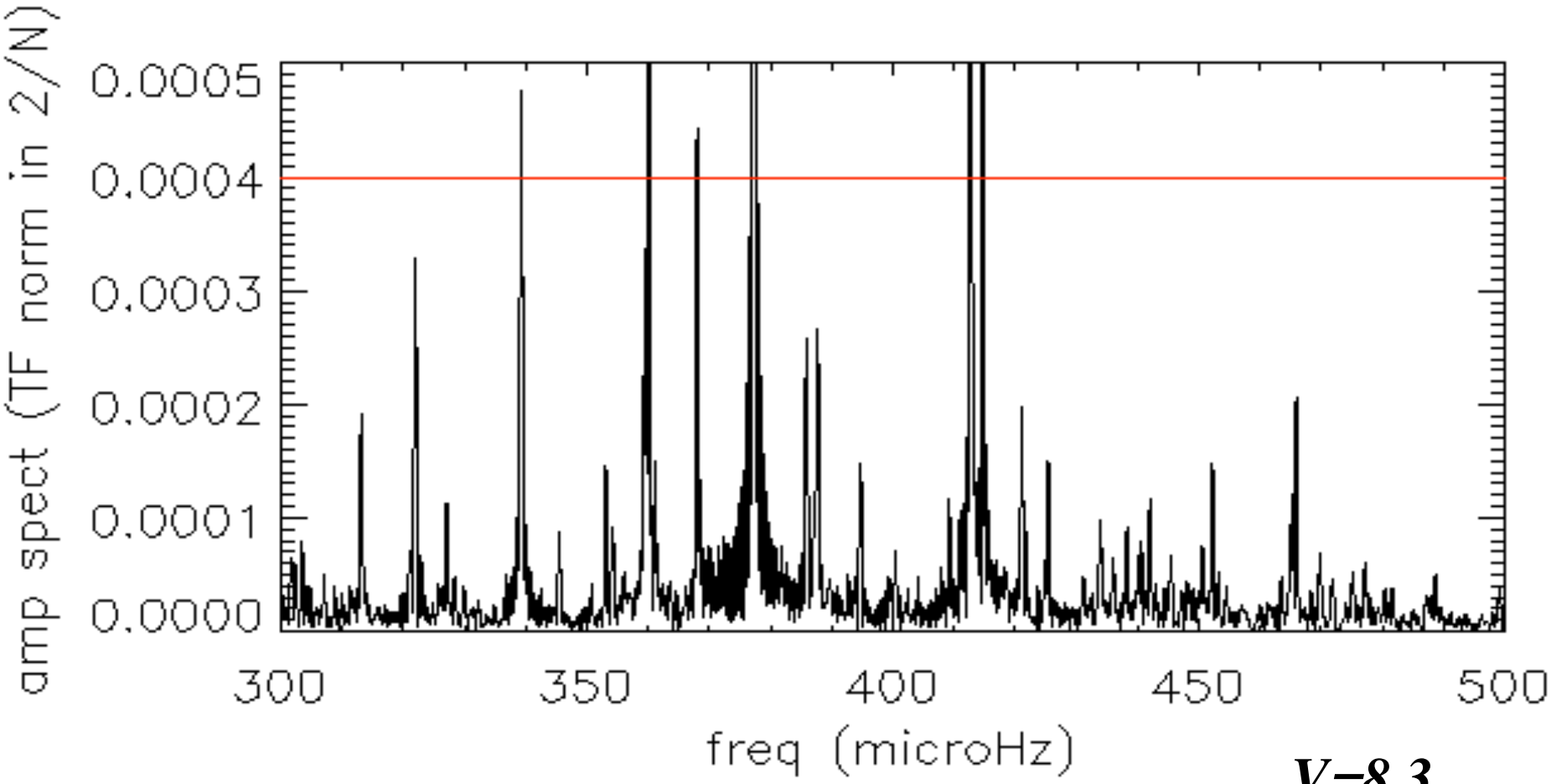
A delta scuti

A constant (?) star



Noise level

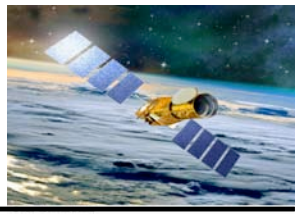


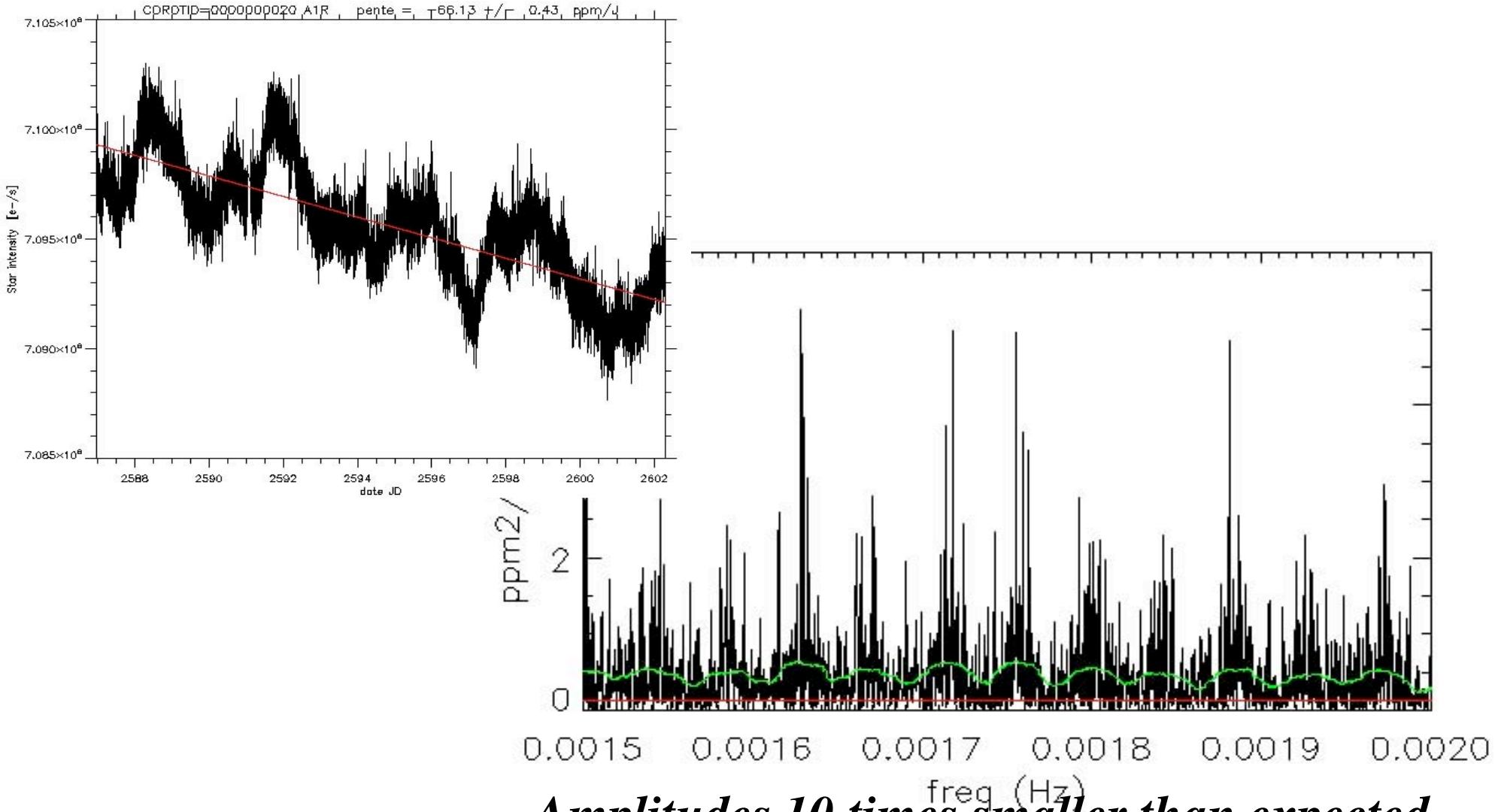


V=8.3

In red, present limit from the ground

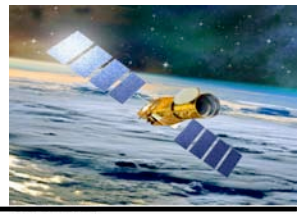
A solar like oscillator



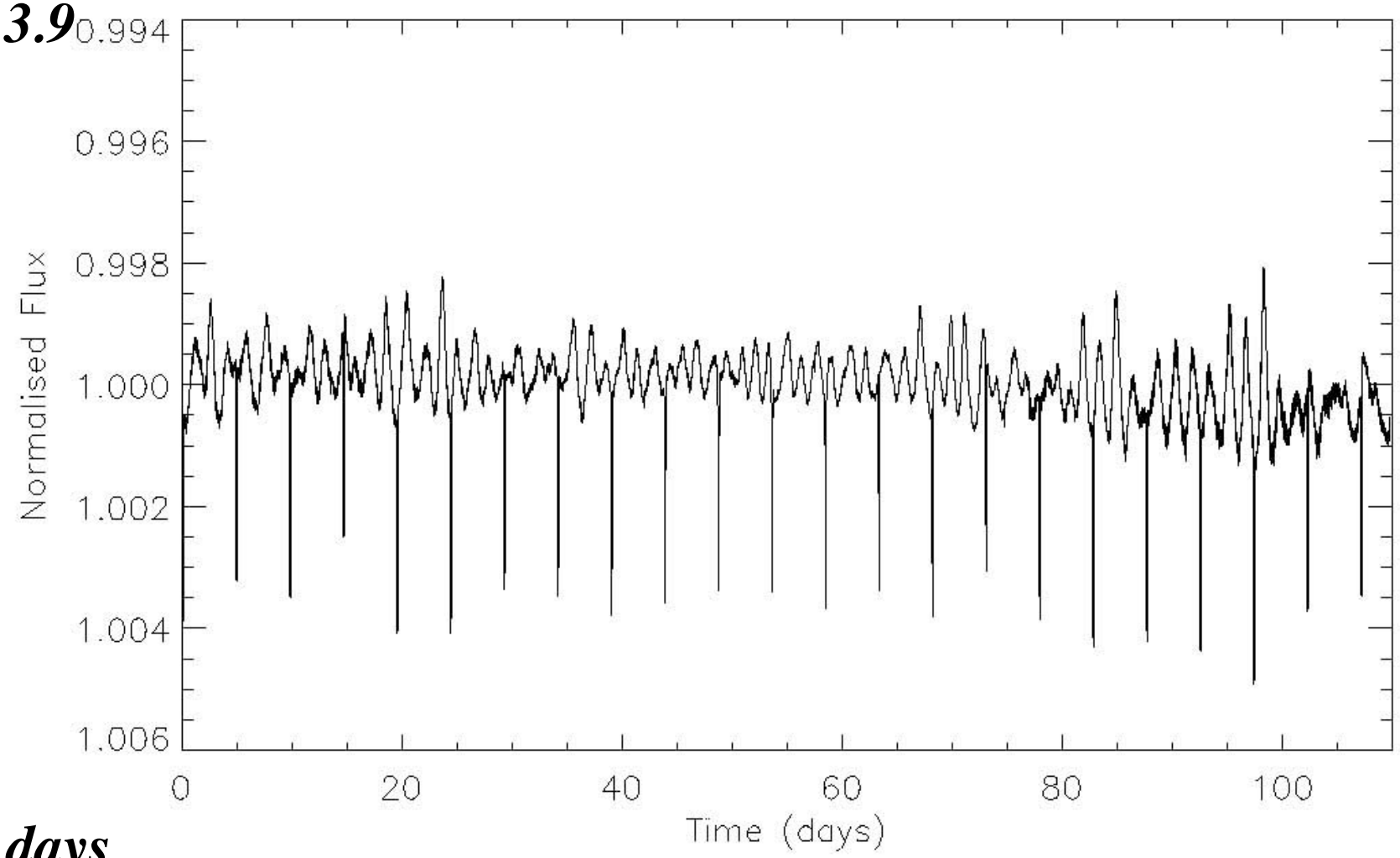


Amplitudes 10 times smaller than expected…

In the exoplanet field

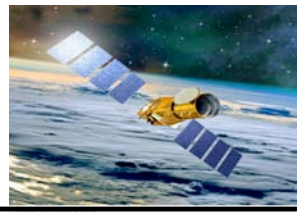


V= 13.9



120 days

General organisation: Partners



Described in the CoRoT Book ESA SP 1306

l'Observatoire de Paris – LESIA
Laboratoire d'Études Spatiales et d'Instrumentation en Astrophysique

LAS

IAS orsay

LAT, CESR / OMP
OCA
LUTH, GEPI / OPM

cnes
CENTRE NATIONAL D'ÉTUDES SPATIALES

Austria

Brazil

Belgium

Spain

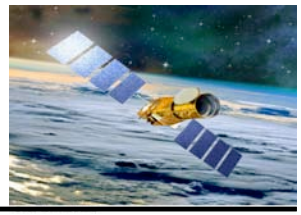
RSSD

Germany

ESA, Sc prog.

http://corot.oamp.fr http://smsc.cnes.fr

Scientific organisation



Scientific Committee

In charge of
- **the scientific specifications**
- **the programme of observations**
- **the data distribution policy**
- **the list of Co-Is and GIs**

CORE programme

Seismology in seismology field

Exoplanet search in exoplanet field

Seismology W.G. *E. Michel*	Seismology G.B. obs. *C. Catala*	Exoplanet W.G. *P. Barge*	Exoplanet GB obs. *M. Deleuil*

Science Teams
Co_Is

Restricted to CO-Is
Access to all data

Additional Programmes

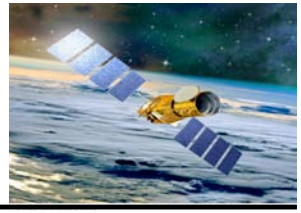
Any science case outside the Core programme

W. Weiss

Sc. Teams
GIs

Open programme Through AOs

Co-Is, GIs and Associated Scientists

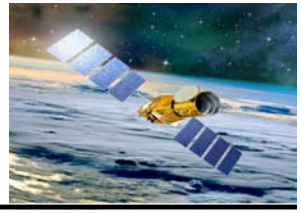


Co-Is 5 per contributing country
majority of frenchs 72

GI s successful proposers to Aos of Aps……not limited

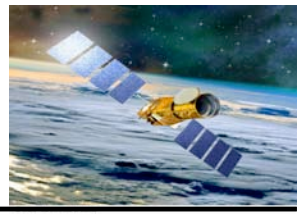
Associated scientists: participating to a team lead by a Co-I or a GI
by the SC

The four levels of CoRoT data



N0	Time-stamped raw data	CNES
N1	Data corrected from main instrumental effects	Science archive then LTAs Upon request
N2	Scientific labelled data (SC)	Science archive then LTAs
N3	Standard scientific products (SC)	Science archive then LTAs

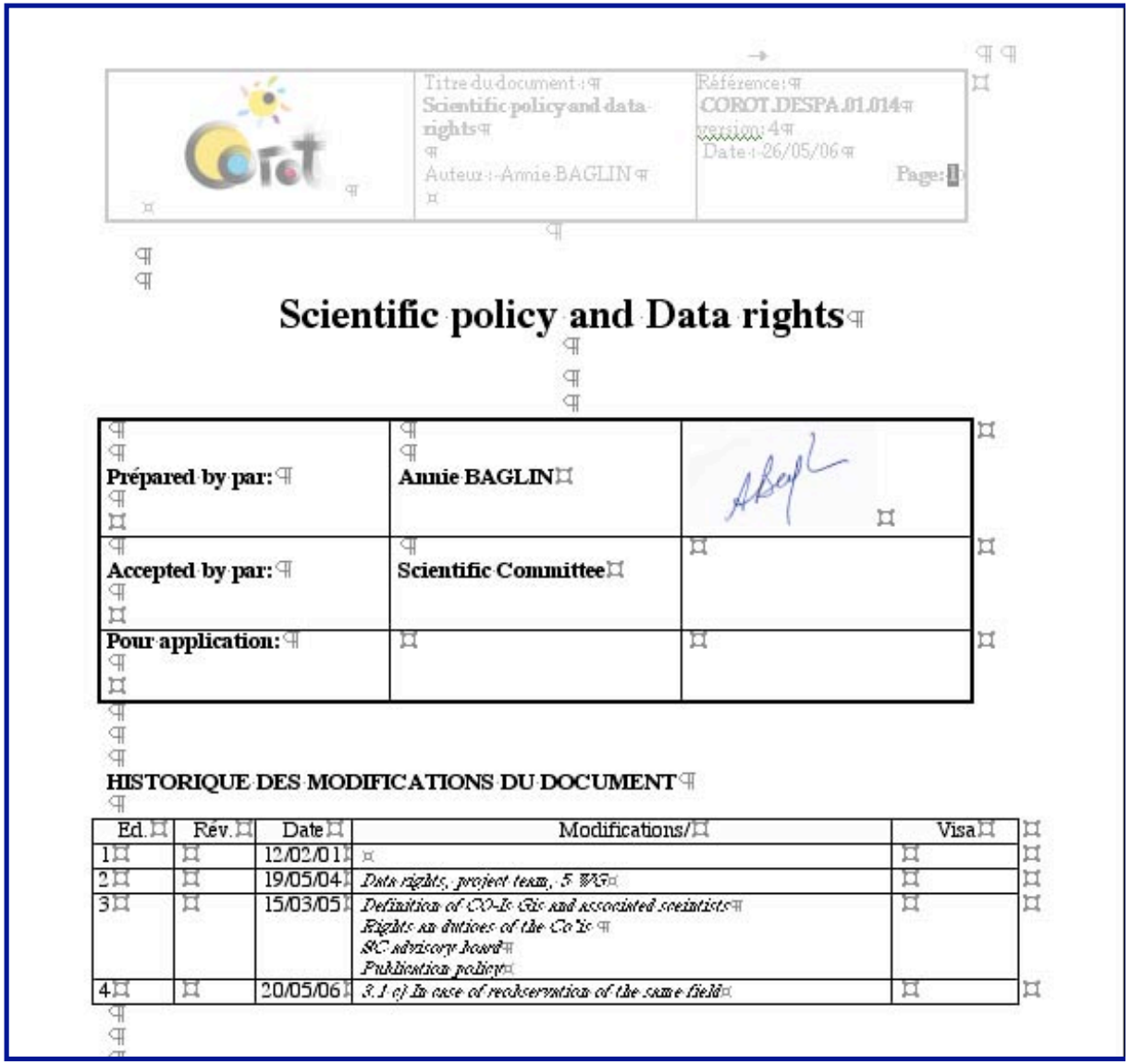
Data policy



The Scientific policy and Data Rights Document

COROT.DESPA.01.014
version 6.1
September 14th 2007

Available at:
http://corot.oamp.fr/scomite.html



Titre du document : Scientific policy and data rights
Référence : COROT.DESPA.01.014
version : 4
Date : 26/05/06
Auteur : Annie BAGLIN
Page : 1

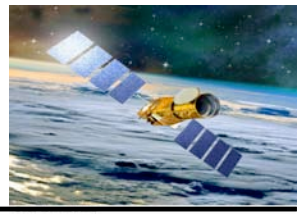
Scientific policy and Data rights

Prépared by par:	**Annie BAGLIN**	
Accepted by par:	**Scientific Committee**	
Pour application:		

HISTORIQUE DES MODIFICATIONS DU DOCUMENT

Ed.	Rév.	Date	Modifications/	Visa
1		12/02/01		
2		19/05/04	*Data rights, project team, 5 WG*	
3		15/03/05	*Definition of CO-Is (Is and associated scientists* *Rights an duties of the Co Is* *SC advisory board* *Publication policy*	
4		20/05/06	*3.1 c) In case of recdservation of the same field*	

Data delivery



The data are processed

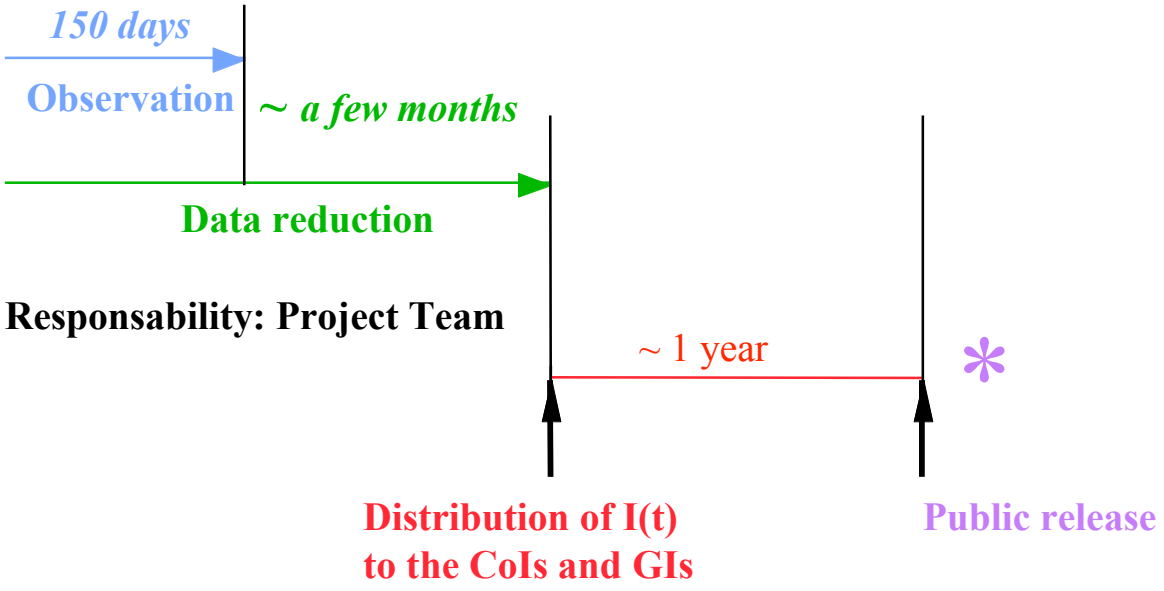
by the CMC (CNES/Labs) first levels

by the CDC (Labs) fianl level.

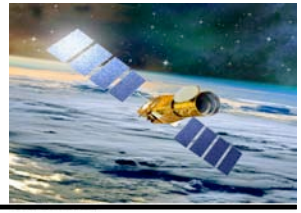
They are archived at IAS

Long term archives

at CDS and LAEFF



Who will get what? Corot programme



The Co-Is access all the data

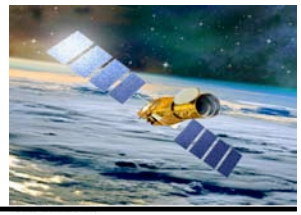
The Co-Is are responsible for the fair use of the data
during the proprietary period

The Co-Is can analyse and interpret the data,
with the Team they are leading

The Team has to be known and accepted by the SC
(Co-Is and Associated Scientists)
has to comply with the publication policy

The answer to the Call for Letter of Intend organises this!

Who will get what? Additionnal Programmes

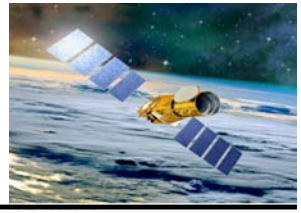


Programmes submitted through AOs
accepted by the SC
agreement on the Team

The team leader becomes GI
access the data as decided by the SC
is responsible for the fair use of these data
during the proprietary period

The members of the team (if not already Co-I or GI)
become Associated scientists for this programme

Ground based Data



COROTSKY Data Basis (OMP Toulouse):

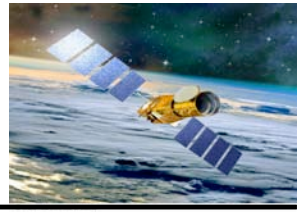
see S. Charpinet at CW9 http://corot.oamp.fr Users interface at OMP …..

* SISMOSKY : V< 9.5 in the eyes of CoRoT (13000*)
  ≠ parameters + Adopted
* EXOSKY : R< 16 in selected area of the eyes (from EXODAT)
  Photometric observations+ parameters
* AP-EXO : selected sources
* USNO_A2

Part of the Corotsky data on observed targets will be included in N1 and N2 and can be used for requests

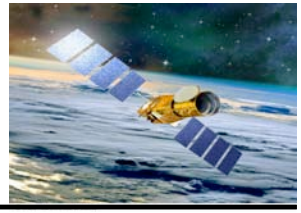
GAUDI (LAEFF): spectroscopic and photometric data of sismo targets (1500*)
1 year proprietary period, then public
Through the Corotsky tool or directly

EXODAT (LAM, Marseille): ground based observations + parameters of selected fields for exoplanets (on request)




15 The CoRoT Pub 15
SCIENCE
- for sure!
CoRoT
Publication

Avec…la CoRoT Bossa



Myriam Adda, Conny Aerts, Georges Alecian, Claudia Andreis, Thierry Appourchaux, Armand, Bernard Authier, Michel Auvergne, Annie Baglin, Pierre Barge, Caroline Barban, Philippe Baron, Frédéric Baudin, Etienne Baudino, Thierry Beaufort, Remy Bellenger, Pernelle Bernardi, Stéphane Berrivin, Gabrielle Berthomieu, Jean-Lucien Boit, Pierre Bodin, Laurent Boisnard, Cédric Bombail, Frédéric Bonneau, Pascal Bordé, Patrick Boumier, Jean-Tristan Buey, Damien Cailliau, Claude Catala, Rafael Cautain, Stéphane Charpinet, Sylviane Chaintreuil, Michel Combes, Eduardo Costa da Silva, Vincent Costes, Josiane Cuvilo, Pascal Dargent, Jean Claude David, Michel Decaudin, Celine Defay, Magali Deleuil, Alain Docclo, Rachel Drummond, Jean-Bernard Dubois, Olivier Dupuis, Gérard Esptein, Fabio Favata, Fabio Fialho, Claudie Fauré, Didier Ferrand, Bernard Foing, Michael Fridlund, Alain Gaboriaud, Rafael Garcia, Rafael Garrido, Marie-Jo Goupil, Loïc Gueguen, Cecil Gueriau, Tristan Guillot, Emmanuel Grolleau, Rachel Gruneisen, Olivier Hagogue, Misha Haywood, Anne-Marie Hubert, Gérard Huntzinger, Constance Imad, George Isaack, Eduardo Janot-Pacheco, Garry Jeanville, Farid Karioty, Laurent Kerjean, Laurent Jorda, Patrice Journoud, Martine Jouret-Perl, Vincent Lafaille, Laurent Lafond, Thien Lam-Trong, Philippe Landiech, Vincent Lapeyrere, Philippe Laudet, Nicolas Lautié, Yveline Lebreton, Helène Le Cann, Alain Léger, Jean-Pierre Lefaure, Philippe Lemaire, Liliane Leporati, Patrick Levacher, Antoine Llebaria, Yiu-Yin Longval, Alain Magnan, André Mangeney, Philippe Mathias, Dominique Mazari, Jean-Michel Ménager, Eric Michel, Jean-Pierre Michel, Jean-Pierre Moalic, Benoît Mosser, Claire Moutou, Raymond Morat, Coralie Neiner, Arlette Noels, Marc Ollivier, Jean-Luc Orcesi, Jérome Parisot, Véronique Pascal, René Perez, Gispert Peter, Alain Piacentino, Leonardo Pinheiro, Philippe Plasson, Jacqueline Platzer, Ennio Poretti, Dominique Pouliquen, Françoise Praderie, Janine Provost, Pascal Puget, Fy Rakotoarivelo, Heike Rauer, Jean-Louis Reynaud, Noël Robichon, Renaud Romagnan, Christine Rossin, André Roussin, Daniel Rouan, Ian Roxburgh, Michel Saisse, Reza Samadi, Régis Schmidt, Jean Schneider, Noah Schwartz, Isabelle Sebbag, Guy Simon, Enrique Solano, Manfred Steller, Magali Tello, Linda Tomasini, Jacqueline Thouvay, Didier Tiphène, Dominique Toublanc, Sylvaine Turck-Chièze, Gérard Vauclair, Sylvie Vauclair, Olivier Vandermarcq, Claude van't Veer, Jean-Claude Vial, Thierry Viard, André Vuillemin, Werner Weiss, Philippe Zanatta,……..et tous les autres……

Certains qui ont disparu…… et d'autres qui sont allés vers d'autres horizons…..