	Title:	Référence:
	<b>Minutes of the 14<sup>th</sup> Scientific Committee</b>  Author : Annie BAGLIN	<b>COROT.LESIA.05. 49</b> <b>Version: 1</b>  Date : 22/03/05

## Minutes of the 14th Scientific Committee

Held in Paris, March 7<sup>th</sup> 2005.


<b>Prepared by par:</b>  <b>Annie Baglin</b>		
<b>Accepted by:</b>  <b>The SC members</b>		

### MODIFICATIONS OF THE DOCUMENT

Ed.	Rév.	Date	Modifications	Visa
1				


### REFERENCE DOCUMENTS

Index	Reference	Title of the document
DR1:	COROT.DESPA.01.014	Scientific policy and Data rights
DR3		

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**DIFFUSION:**

G. ALECIAN	OPM	X
M. AUVERGNE	OPM/LESIA	X
A. BAGLIN	OPM/LESIA	X
P. BARGE	LAM	X
C. CATALA	OPM/LESIA	X
M. DELEUIL	LAM	X
F. FAVATA	RSSD/Estec	X
R. GARRIDO	IAA/Spain	X
T. GUILLOT	OCA	X
E. JANOT-PACHECO	Sao Paulo University	X
L. JORDA	LAM	X
J-L. COUNIL	CNES	X
T. LAM-TRONG	CNES	X
M. OLLIVIER	IAS	X
E. MICHEL	OPM/LESIA	X
A. NOELS	IA Liège	X
H. RAUER	DLR Berlin	X
D.ROUAN	LESIA	X
I. ROXBURGH	QMW London	X
J. SCHNEIDER	OPM	X
G. VAUCLAIR	OMP	X
W. WEISS	IA Vienna	X
P. BODIN	CNES	X
L. BOISNARD	CNES	X
C. IMAD	OPM/LESIA/secretariat	X

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## Participants:

All members except D. Rouan, E. Janot-Pacheco, A. Noels, T Lam-Trong, M. Joubert  
 Marc Ollivier replaces Alain Leger as proposed at the last meeting  
 The CNES representative will be now Jean-Louis Council, appointed recently.

Due to the lack of time only points 1, 2, 3, 4, 7 and 9 of the agenda have been discussed.  
 Discussion of the other topics, considered as less urgent, is postponed to the next SC in Toulouse, on May 23<sup>rd</sup>.

## 1. Choice of the fields of the two first long runs

We have to agree on an approximate position of the field of these two runs, within let say 10 arc minutes.

### 1.1. The anticentre

In Granada it has been decided that the first field of the anticentre should be 49933/49434. But the precise position remained a question of debate due to technical questions about the full well capacity of the CCDs and incomplete stars counts on the exoplanet field.

These two points are now settled.

Both programmes are in favor of a lower position.

- for seismology it allows to catch the most interesting targets in the vicinity

HD 49808 a solar like pulsator FOV (case 1)  $v_r=113.6$   
 HD 49385 a G0 solar like  $v_r=7.5$   
 HD 49330 a Be (B0)  
 HD 49567 a bright B3  
 HD 49713 an Ap B0 star, periodic variable  
 HD 50086 a late B (B8)  
 HD 50209, a late Be.....

- for exoplanet the density is quite homogeneous in this region, higher in the north, so favorable to the proposal of SWG.

MD proposes to define an exo-target as a star with a contamination level  $<0.2$


The total number of stars  $R<16$  in the field is 14 000. There are 65% of targets and between 75 and 80% of dwarfs

The estimated number of targets brighter than  $R=16$  (total surface of the exo-field=  $3.2d^{\circ}$ ) is 9000. And the number of target dwarfs  $R<15$ : 7100.

These values are smaller than the values given by Magali, due to an overestimation of the available surface of the CCDs!

- the Additional Programmes have identified a Nova which is not observable in this position

- MA accepts this position, where the two bright targets are on A2, outside the region of lower full well capacity.

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The position adopted is defined by

- pointing direction (centre of the CCDs): **alpha= 101.7, delta=-0.19**
- **row angle: 7.3**

## 1.2. The centre

As the position of the pre-selected fields in the centre implies that if the field HD 181555/180642 is selected it has to be observed first, this field has been compared to the other four preselected ones. If it is not considered as the worst one, it will be observed, then needs to be first....

For the seismology programme, the field of HD 181555/180642 seems the reachest of the preselected fields of the centre.

It contains

- a delta scuti star
- a known beta ceph,
- 2 late B one probably variable
- 2 late F
- 3 early F (two being quite bright)

For the exoplanet programme, HD 177552 is a very bad field, and the ECOWG asks to withdraw it from the list.

The other fields are almost equivalent, though 170580 has a lower density

The SC has unanimously decided to choose HD 181555 as the first field of the centre direction.

This implies a modification of the original ascending node of the orbit at 14.5 degrees.

The demand from the exoplanet group to shift towards lower alpha seems difficult to accept by the seismology programme. A more precise evaluation of the gain in terms of exoplanet detection is required. **Action SC14-1 for Magali.**

The proposed approximate position corresponds to : **alpha= 290.87, delta= 0.48, row angle: 19**

As many seismology targets are close to the borders of the CCDs a more precise tuning will be needed which may drop out one of the proposed secondary targets.

## 2. A possible first “short” run

AB presents the foreseen planning

- \* date of launch : July, corresponding to a period of pointing towards the centre direction
- \* 14 days of first technical commissioning
- \* opening of the cover and Instrument calibrations (between 15 and 30 days)


As the date for turning towards the anticentre direction is around October 10<sup>th</sup>, there should be time for a run of approximately 20 days.

This run, if it can be done, will produce the first “scientific data”. It has to be chosen carefully to produce results for public relations.....

It has also to be as easy as possible to programme, as at that time the instrument could still be under some testing.

It seems reasonable to observe in a region observed by the ECOWG.

The seismology field should contain at least one known variable star.

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It is decided that the SWG will examine these regions to prepare some propositions at the next CW.  
**Action SC14-2 for Eric M.**

### 3. Scientific priorities for the targets selection in the exoplanet field

M. Auvergne recalls the need of the instrument team to have clear priorities, to be able to make choices during the technical adjustment of the observation.

#### 3.1. The scientific priorities

P. Barge recalls that the mission has been designed to discover **small planets**.

The noise level is  $1.5 \cdot 10^{-3}$  in 1 hour for a 15 V magnitude star, as specified.

This allows to detect a planet slightly larger than the Earth orbiting around a dwarf.

But terrestrial planets are not detectable around giants, except if they are extremely bright, and around stars fainter than 15.5.

Taking into account the distribution of stars as a function of magnitude and spectral type, and the detection probability of a transit as a function of magnitude, Bordé et al. have shown that the most promising targets in terms of number of detection are dwarfs with magnitude between 14 and 15. Though this work has used the Besancon model and not true stellar densities, the conclusions are roughly correct.

The Sc confirms that the successive steps of the treatment should optimize the S/N ratio for dwarfs brighter than 15.

#### 3.2. The templates

P. Barge recalls that the method to compute the templates optimises S/N, where all sources of noise are taken into account: background, jitter, readout noise and contamination by neighbors.

As the contamination is an important noise, the tool Corotsky to prepare an observation allows to select set of targets as a function of astrophysical parameters and contamination factor (at zero level)  $c_0$ .  $c_0$  is completely independent of the instrumental noise and does not take into account any source of intrinsic variability.


P; Barge describes the strategy proposed by LAM and implemented by A.L. to compute the templates.

The recent results of A.L. giving the set of templates as a function of magnitude, show that the requirement of optimisation for bright stars is satisfied. More than half of the templates are dedicated to stars brighter than 14.

The fainter stars, which are still numerous (as many stars with  $15 < R < 16$ , as stars with  $R < 15$ ), which do not correspond to the highest priority of the mission are generally more contaminated. It is proposed by H. Rauer to try to impose some regularity to the templates, to avoid creating awkward shapes, used scarcely.

These last results show also that the set of templates depends on the field on which they have been computed. But it is difficult to estimate how important it is presently.

From the operationnal point of view, it would be interesting to have a generic set, independent of the field, as stressed by M.A. But presently it is not demonstrated that it is possible.

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The SC would like to make sure that the optimisation is robust, with respect to the shape and the list of templates.

P. Barge (**Action SC 14-3**) proposes to discuss with A.L. to

- confirm that the scientific priorities are taken into account in the computation of the templates
- estimate the quality of the optimisation process
- find criteria to compare two sets of templates for a given field
- evaluate the robustness of the templates for different fields.

### 3.3. The problem of intrinsic stellar variability causing false alarms

As stressed by T. Guillot, it is known that eclipsing binaries will be the main cause of false alarm. This is the case of OGLE and is also demonstrated by his tool CoRoTLUX.

The question is: should we try to find templates which reduce these false alarms. The solution proposed by Tristan would be to reduce the size of the masks.

But it also reduces all S/N.....So the large majority of the SC is not in favor of this solution.

P. Barge remarks that the large PSF, with the separation in colors, will help distinguishing such cases, if the eclipsing binary is sufficiently far from the target.

J. Schneider says that es the shape of the light curve generally allow to separate the binary from the transit.

The conclusion is that these false alarms are unavoidable without degrading considerably the mission.

In many cases, the only solution to detect them is through follow-up spectroscopic observations, It is a huge work we have to prepare already now.

## 4. The Announcement of opportunity for the Additional programmes (first year)

W. Weiss presents the project of letter and web form.

Very few comments have been send in advance.

F.Favata proposes to reduce the items of the web form and to ask for a 4 pages scientific rationale, free format in pdf, + 1 page CV. This is accepted by the SC.

It is stressed that access to CoRoTsky may be needed.

During the preparation phase, the CoRoTdemo/ CoRoTdemo access is sufficient.

The GIs will obtain a personal access, after selection.


The last version of the documents will be circulated among the SC by W.W. before March 12. The Sc members will have to comment before March 16. (**Action SC14-4**)

On March 20<sup>th</sup>, the announcement will be posted on the web site as a news, send by e-mail to the list of the CoRoT Community (people having attended a CoRoTWeek) and to the ESA community.

F. F. will provide the mailing list of ESA to Werner. (**Action SC14-5**)

The schedule is fixed as follows:

- March 20<sup>th</sup> : issue of the AO
- July 5<sup>th</sup>: dead line for answer
- September 5<sup>th</sup> : SC meeting for selection
- September 10<sup>th</sup> : official answer

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## 5. Complementary observations

Following the recent discussions at the ESO/ESA meeting we are encouraged to prepare a document describing more precisely our needs.

C. Catala recalls the need to organize long ground-based monitoring, in high resolution spectroscopy and photometry on some of the targets. This means several long runs (10 to 15 days) on HARPS, which have to be organised now.

G. Vauclair says that presently the Toulouse group is preparing a proposal for observing HD 52265 with HARPS. As the Meudon group is also preparing a proposal on this instrument, some coordination is needed.

M. Deleuil recalls that in the exoplanet programme there is still a need to characterise at best the population of targets.

Follow-up observations on candidate planets will be badly needed to decipher the false alarms of the detection algorithms, and to determine more completely the nature of the parent stars.

As the framework of the possible use of this document is not completely clear yet, it is proposed by F.Favata to investigate more, discussing with ESA and ESO. We have also to know what would be the dead-line.

F. Favata accepts to become the contact person for this, if needed.

## 6. Data rights document

A new version has been distributed by A.B. including the different remarks by A.B. Some final tuning is needed. The final text will be distributed for agreement very soon.

## 7. Next CW in Toulouse

The dates are May 24<sup>th</sup> to 27<sup>th</sup>.

The Scientific Committee will meet on **Monday May 23<sup>rd</sup>**, probably starting in the morning. A second short session will be held on **Friday 27<sup>th</sup>**, probably just after lunch .

The web site will be open very soon on both sites:

<http://corot.oamp.fr>

<http://smc.cnes.fr/COROT/>

## 8. Modification of the list of Co\_Is


W. Weiss proposes to replace T. Lebzeltzer by Rudolf Dvorak, a specialist of dynamics of exoplanet systems.

## 9. Status of the baffle

Following a question of F.F., A.B. describes the situation concerning the baffle delivery.

The crisis of December is over, and our letter has probably been useful.

The recommendation of ESA and CNES to modify the feets has ben taken into account. They are manufactured and tested presently. The procurements for the flight model are ongoing. The delivery of the flight model in June is compatible with the planning, though some optical tests had to be postponed after the integration of the instrument.

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## 10. Long duration test of the camera

Following a statement by M. Ollivier, who expresses the worry of the CoRoTCAM team concerning a possible reduction of the long duration test of the camera, due to some delays in the calibrations, M. A. confirms that this test is a must and that he will not accept a reduction of its duration.

The SC confirms his strong support.

After the meeting, the project manager has confirmed that this test is preserved for 21 days as required in the last version of the planning, from March 31th to April 21st .

## 11. Actions

### 11.1. Actions from SC12 still open

SC12-10	Presentation EXODAT policy	MD	SC13	Postponed to SC15
SC12-11	Designation of an outreach person	Non French SCM	ASAP	For some only


### 11.2. Actions from SC13

SC13-3	Organisation of CW10 in France	AB	March 2005	Postponed to SC15
SC13-7	Web page for ESA	AB	Jan 31st	
SC13-8	Integration in ESA site	FF	ASAP!	

### 11.3. Actions from SC14th

SC14-1	Analysis of the field 181555 for exo	MD	SC 15	
SC14-2	Preparation of a short run	EM	CW8	
SC14-3	Tests of the template softwrae	P.B.	April 2005	
SC14-4	AO AP	W.W.	March 20th	
SC14-5	Mailing list of ESA to WW	FF	ASAP!	
SC14-6	More info on an ESO/ESA plan	F.F.	April 2005	




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## Annex A: List of Co-Is as presented at this meeting

<i>Name</i>	<i>First name</i>	<i>Country/lab</i>	<i>Institution</i>	<i>Activity</i>	<i>WG</i>
<b>RAUER</b>	<b>Heike</b>	<b>Germany</b>	DLR Berlin	Dynamics of the Hot Giants	E/EGBO
HATZES	Artie	Germany	Thueringer	GBO exo and sismo	E/S
PAETZOLD	Martin	Germany	Koln	Exo atmospheres	E
WUCHTERL	Guenther	Germany	MPI	Planet formation, mass distribution	E
<b>FAVATA</b>	<b>Fabio</b>	<b>ESTEC</b>	RSSD	Activity	S/E
FOING	Bernard	ESTEC	RSSD	Link to space missions, activity	A
FRIEDLUND	Malcom	ESTEC	RSSD		?
GONDOIN	Philippe	ESTEC	RSSD		?
<b>NOELS</b>	<b>Arlette</b>	<b>Belgium</b>	Liège	Stellar evolution	S
AERTS	Conny	Belgium	Leuven	Beta Ceph, SPB	S
SCUFLAIRE	Richard	Belgium	Liege	Non adiab analysis	S
MAGAIN	Pierre	Belgium	Liege	Spectroscopy analysis	SGBO
De RIDDER	Joris	Belgium	Leuven	Seismology of red giants	S
<b>GARRIDO</b>	<b>Rafael</b>	<b>Spain</b>	IAA	GBO photometry	S
RIBAS	Ignacio	Spain	Barcelona	Eclipsing binaries	AP
DEEG	Hans	Spain	IAA	transit detection	E
ROCCA-CORTES	Theo	Spain	IAC	Data analysis and interpretation	S
SOLANO	Enrique	Spain	LAEFF	GB Data base	SGBO
<b>WEISS</b>	<b>Werner</b>	<b>Austria</b>	Vienna	APWG +lambda Boo, Ro Ap	S/AP/SGB
DVORAK	Rudolf	Austria	Vienna	Dynamics of exoplanetary systems	E
HANDLER	Gerard	Austria	Vienna	gam Dor	AP/S
LAMMER	Helmut	Austria	Graz	exoplanet atmospheres	
<b>ROXBURGH</b>	<b>Ian</b>	<b>UK</b>	QMW London	Excitation and amplitudes	S
COLLIER-CAMERON	Andrew	UK	St Andrews	Activity modelling	AP
QUELOZ	Didier	Switzerland	Geneve	GB follow-up	E
KJEDSEN	Hans	Denmark	Aarhus	TBC	SGBO
MONTEIRO	Mario	Portugal	Porto	Stellar modelling (TBC)	S
<b>JANOT-PACHECO</b>	<b>Eduardo</b>	<b>Brazil</b>	Sao-Paulo	Seismology of hot stars	S/SGBO
GREGORIO-HETEM	Jane	Brazil	Sao Paulo	pre main sequence	AP
De la REZA	Ramiro	Brazil	ON Rio de J.	protoplanets	AP/E
CUISINIER	François	Brazil	OV Rio de J.	Giants	AP
RENAN de MEDEIROS	José	Brazil	Natal	solar like, rotation	S, AP
PORETTI	Enio	Italy	Merate	Spectroscopy/delta scuti	SGBO

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<b>MICHEL</b>	<b>Eric</b>	<b>France</b>	LESIA	SWG+delta scuti analysis	S
<b>CATALA</b>	<b>Claude</b>	<b>France</b>	LESIA	SGBOWG	SGBO
<b>ROUAN</b>	<b>Daniel</b>	<b>France</b>	LESIA	Onboard treatment	E
GOUPIL	Marie-Jo	France	LESIA	Moderate rotation	S
MOSSER	Benoit	France	LESIA	Solar system planets	E/S
SAMADI	Reza	France	LESIA	Amplitudes	S
TIPHENE	Didier	France	LESIA	Instrument	Inkster
BARBAN	Caroline	France/NOAO	LESIA	Synthetic light curves, colours	S
<b>SCHNEIDER</b>	<b>Jean</b>	<b>France</b>	LUTH	Exoplanet science and ambiguities	E/EGBO
<b>ALECIAN</b>	<b>Georges</b>	<b>France</b>	LUTH/GEPI	Chemically peculiar stars	S
HUBERT	Anne-Marie	France	GEPI	Be stars	AP/S
LEBRETON	Yveline	France	GEPI	Stellar models	S
<b>LEGER</b>	<b>Alain</b>	<b>France</b>	IAS	Earth like planets	E
BOUMIER	Patrick	France	IAS	Instrument	Inst
BAUDIN	Frederic	France	IAS	Time frequency analysis	S
OLLIVIER	Marc	France	IAS	Instrument	E/Instr
APPOURCHAUX	Thierry	France	IAS	Data analysis	S
<b>BARGE</b>	<b>Pierre</b>	<b>France</b>	LAM	EWG+Hot planet statistics	E
<b>DELEUIL</b>	<b>Magali</b>	<b>France</b>	LAM	EGBO	EGBO
<b>JORDA</b>	<b>Laurent</b>	<b>France</b>	LAM	Data reduction	E
MOUTOU	Claire	France	LAM	EGBOWG	EGBO
LLEBARIA	Antoine	France	LAM	Masks in E field	E
BOUCHY	François	France	LAM	Radial velocities	EGBO
<b>VAUCLAIR</b>	<b>Gerard</b>	<b>France</b>	OMP/LAT	WD	S
TOUBLANC	Dominique	France	OMP/CESR	Catalogues	E
VAUCLAIR	Sylvie	France	OMP/LAT	Diffusion and mixing	S
RIEUTORD	Michel	France	OMP/LAT	Fast rotation	S
CHARPINET	Stephane	France	OMP/LAT	CoRoTsky	SGBO
LIGNIERES	François	France	OMP/LAT	Rotating models	S/SGBO
<b>GUILLOT</b>	<b>Tristan</b>	<b>France</b>	OCA	Hot Jupiters	E
PROVOST	Janine	France	OCA	Direct seismic analysis	S
BERTHOMIEU	Gabrielle	France	OCA	Optimisation interpretation	S
TOUTAIN	Thierry	France	OCA	Data analysis	S
MATHIAS	Philippe	France	OCA	Gamma Doradus stars	S
TURCK-CHIEZE	Sylvaine	France	Sap/CEA	Modélisation 1.5D	S
GARCIA	Rafael	France	Sap/CEA	Data reduction	S
<b>AUVERGNE</b>	<b>Michel</b>	<b>France</b>	LESIA	IS	Inst
<b>BAGLIN</b>	<b>Annie</b>	<b>France</b>	LESIA	PI	