Minutes of the 6th Scientific Committee

Préparé par:	Annie Baglin and the speakers	
Accepté par:	The Scientific Committee	
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HISTORIQUE DES MODIFICATIONS DU DOCUMENT

Ed.	Rév.	Date	Modifications/	Visa
1		05/05		
2		**29/05**	***Relative position of sismo and exo fields page 15***	

DIFFUSION:

G. ALECIAN	Meudon	X	
E. ANTONELLO	Merate	X	
T. APPOURCHAUX	SSD/Esrec	X	
M. AUVERGNE	Meudon	X	
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C. CATALA	OMP	X	
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M. DELEUIL	LAM	X	
G. EPSTEIN	MEUDON	X	
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C. IMAD	MEUDON	X	
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D. TIPHENE	MEUDON	X	
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Minutes of the 6th Scientific Committee

The meeting was held at Paris Observatory, salle de l'Atelier, on April 2 and 3

As proposed during the meeting, these minutes contain a rapid description of each contribution, following the programme and the major decisions.

Part 1: Progress report on the scientific activities

1.1. The Exoplanet Working Group

1.1.1. General activities

Pierre Barge

The role of the EWG is:

- to prepare the mission and the production of validated light-curves for the targets of the exoplanet field
- to attend to the realisation of the Exoplanet Core Program,
- to promote and optimise the scientific impact of the mission.

The work of the group is organized in:

(i) preparatory tasks (building of the chromatic device, preparatory observations, development of the COROTLog softwares, development of the Exo Scientific Ground Segment);

ii) optimization tasks which consists in working for a deeper impact of the future Exoplanet data using complementary observations and/or theoretical developments; this scientific preparation is divided into a number of research domains (Analysis with respect to the planet formation models, Physics of the Hot Gas Giant planets, Exoplanetary atmospheres and the star/planet interactions, Search for planets in the Habitable Zone, Discrimination of planetary transits from stellar activity, Planets in binary systems - Ringed and "mooned" planets).

The EWG is composed of people working on one of the tasks defined above.
The responsibles of the preparatory task, the chairs and co-chairs of the research domains receive the status of a Co-I, according to the scientific data policy of COROT.

1.1.2. Colours

Daniel Rouan

Until recently attention has been mainly paid to solar type stars, when dealing with use of the chromatic information to discriminate transits (basically achromatic events) against stellar activity (very chromatic events). A recent work has been to take into account in a better way the effect of temperature and the optimized selection of the color zones when one deals with a bluer or more frequently a redder star. A first problem is that cool stars have much less blue photons so that one may think the chromatic info to be useless.
A linked question is : *what is the best definition of colour domains vs stellar type ?*

One shows (P. Bordé, D. Rouan & A. Léger, in preparation) that in fact the chromatic effect (i.e. the steepness of the curve of relative flux variation vs lambda) is larger in cool stars, so that there is practically a compensation : despite there are less blue photons, the bluest part of the spectrum (even if it is green rather than blue) exhibits a stronger relative variation than in a hotter star.
In practice, this means that there is an almost universal definition of colours in each stellar window of Corot, that is based on the relative proportion of bluer and redder parts, rather than on wavelength. This set of optimum percentage in photo-electrons that define each of the three bands is B = 30 % (of the bluest photo-e); V = 30 % ; R = 40 % (of the reddest photon-e).
Another recent work was the prediction of the magnitude and spectral type of the best candidates for detection of *small planets* with Corot. Using the Besancon model and realistic performances of Corot, we estimated that the best candidate, in terms of frequency of detection, appears to be typically **mv = 14 and Sp = K5.**

1.1.3. The biprism system

Michel Decaudin

* *Optical studies*

We worked on the different possible solutions in order to justify the choice for a biprism:
- A blazed-transmission grating and a tri prism have been evaluated; the grating option is not convenient because of the secondary order spectrum, the triprism option displays no significant improvement in the image quality, but leads to thick prisms and arises hard mechanical mounting difficulties.
- We developped tools to interprate the ZEMAX outputs in terms of COROT science, when ZEMAX is used as a wavefront propagation simulator.

* *Mechanical studies*

A new quasi isostatic mounting is being evaluated:

* By numeric simulations :

We performed mechanical simulations on the glass prisms, and are to simulate the mechanical INVAR handling in order to check that its first vibration mode is outside of the dangerous frequency band.

* A mechanical breakdown is going to be vibrated in IAS

1.1.4. Influence of the stellar background and of the zodiacal light

André Vuillemin

We propose to initiate a modeling of the exoplanet field, made of a realistic composition of stellar images in a field, to study the influence of faint stars on the photometric accuracy.
As a first step we built a CCD image of the stellar background defined as the contribution of all the stars of the field between m_{red}= 15.6 and 23.0. Stars (coordinates and red mag) are taken from the PMM Data. The star counts in the field fit nicely the standard law corresponding to the same galactic latitude; this law is extrapolated above m_{red}=19 (not listed in the red PMM catalogue).
A unique PSF corresponding to K2 spectral type star, with an average quality (middle of the field) has been used for all the stars.

Then a target is superimposed on this background and the photon noise as well as the zodiacal light contribution are included to built an elementary exposure of 32 s; 30 such elementary exposures are added to create the nominal image with an exposure time of 16 minutes.
An example is given with a target of m_{red}=15.5 (mv=16, the faintest targets considered in the programmes), which experiences a transit. The modification of the image due to the transit is easily detected for a Jupiter like planet (delta mag = 5 10**-2) and at the limit for a Uranus like one. Work is in progress!

1.1.5. The german contribution

Heike Rauer

A brief overview of the hardware and scientific contributions to the COROT project was presented.

The Institute of Space Sensor Technology and Planetary Exploration of the German Aerospace Center (DLR-WP) plans to provide the onboard software of the COROT instrument, and a DPU-board extending the CCD test bench.

The method of transit detection of extrasolar planets and related software tools are studied at DLR-WP by a small ground-based telescope system.

Ground-based support for COROT will also be provided by the 2m Schmidt telescope of the Thueringer Landessternwarte Tautenburg (A. Hatzes, TLS). In addition, TLS will participate in the study of asteroseismology (e.g. of ro-Ap stars).

The formation of close-in gas planets (e.g. 'hot Neptunes') in the range detectable by COROT will be studied by G. Wuchterl at the MPI for Extraterrestrial Physics (MPE).

M. Paetzold at the Institute of Geophysics and Meteorology at the University Cologne (IGM) will study the effect of tidal and magnetohydrodynamic interaction with the central star on planet evolution.

1.2. The Seismology Working Group,

1.2.1. Activity and organization

Eric Michel

The overall responsability of SWG is to prepare the optimal scientific interpretation of the COROT data, in terms of the seismology Core Program.
This Core Program is defined in the specification document COR-SP-0-83-PROJ, (17/12/97) available at http://www.astrsp-mrs.fr/projets/corot/sismo-stel.html. It is strongly focussed on convection, rotation, core overshooting, or, more generally, transport mecanisms, including transport of chemical species, for stars around the main sequence phase.
To do so, the SWG has to :

-identify the weak points in the theoretical, numerical, observationnal arsenal available for the analysis and interpretation of the data.

- promote the investigation of these points

The SWG activity can be described in terms of phases:

Phase I - "take care of the weak points"

A first phase of the activity of the SWG has been initiated at the COROT Kick-off Meeting (Nice 1998), where several weak points have been identified and designed as prioritary thema for the SWG.
As a result, several works have been initiated to produce or test the necessary tools and techniques. The COROT/SWG/Milestone meeting held in Paris in september 2000 gave a good picture of the situation. Proceedings are available at http://dasgal.obspm.fr/~michel/COROT-SISMO.html

While these activities have to go on but, it already brought significant results:
ground-based observations tend to confirm that solar-like oscillations exist in other stars with amplitudes roughly comparable to predictions;
solutions exist to handle numerically the effect of fast rotation on the eigenfrequencies up to significant rotation rates,
techniques are proposed to tackle important features of the internal stellar structure without individual identification of the detected modes.

Phase II - "How to answer which aspect of the core program, and with which data "
We have now to prepare the practical realisation of the Seismo Core Program, considering the specific set of objects which might be observed with COROT.
As the plane of the orbit will be selected to-day (see 2.2.1.), the set of potential targets will be precisely known now.
We thus should be able to sketch the phase of exploitation of the data to come, in the framework of the Core Program. This has to be done with a few points in mind:
- Optimizing the scientific outcome with respect to the Core Programme;
- Identifying "programs", i.e. specific scientific objective+people+data. In fact such proposals already exist, but the SWG, under the responsability of the CSC will have to coordinate this work.

Organisation - a SWG Board:
The SWG is now composed of about 90 members in a dozen of institutes, mostly in Europe.
In order to coordinate the SWG work further, we are organizing a SWG Board, composed of representatives of the different contributors to Corot actively involved in the SWG.
This Board will be a consultative committee where the organization of the SWG activity can be discussed. We will have to discuss how the phase 2 mentioned herebefore should be organized.

1.2.2. SB2 stars: Seismological targets for COROT?

J.-C. Suarez, Alain Hui-Bon-Hoa, E. Michel

The main goal is to investigate to which extent the SB2 stars can be good candidates for COROT. There are bright SB targets fulfilling the characterictics of the Core Programme in the different scenarios. The mass difference ranges from 0.02 (HD 60803, 1.09 and 1.01 solar mass) up to 0.2 solar mass (HD 166285, 1.3 and 1.5 solar mass). HD 191104 was found to be a quadruple system.

From a seismological point of view, it is essential to be able to resolve individual spectra from the composite one. We consider here a grid of models in the concerned range of mass ~[1,1.5Mo] and evolution stage (beggining, middle, end of MS). For each of these models, we compute models for the "secondary", with the same age and with mass differing from the "primary" one by

[0.05,0.5,1]. Frequency spectra are computed, including l=0 to 2 and with constant arbitrary amplitudes, in the range where solar-like oscillations are expected (cf. R. Samadi et al, 2000).

As expected, in most of the cases, the two individual spectra overlap to a large extent, and this overlap decrases for increasing mass difference and the age. A ~50% overlap requires of the order of 0.5 Mo mass difference. Only for extreme mass difference, (1 Mo) there is no overlapping.
We then consider the problems induced by the overlap of the spectra in terms of peak resolution. Histograms of the frequency separation between consecutive peaks are built for individual and composite spectra.In these histograms, for a given intrinsic width of the peaks, it is possible to estimate the number of peaks which cannot be resolved. We observe that the number of modes which cannot be resolved in the composite spectrum is not significantly higher than the simple sum of those which cannot be resolved in each individual spectrum.

This preliminary work has not taken into account
- rotation splittings. This is correct only for rotation rates smaller than~ 0.5 microHz (P~ 20days).
- the eventual appearance of l=3 (or higher).
- eventual amplitude differences between the primary and the secondary. This might become significant for the high mass difference.
- the photon noise which increases due to the addition of the light of the two targets.

Up to this stage, we conclude that there is no reason to rule out definitely SB2 binaries as potential targets for COROT. While they probably cannot be reasonably selected as "Prime Targets" for 150d runs, they constitute high potential targets for the exploratory program as well as for "Secondary Targets".

1.2.3. Analysis of WIRE data of the massive star Mimosa

J. Cuypers, C. Aerts, D. Buzasi, J. Catanzarite, R. Laher, T. Conrow

The star Mimosa (Beta Crucis) is a Beta Cep star of which extensive ground-based photometric data reveal one frequency, while a recent high-resolution line-profile study points towards multiperiodicity in three modes.
The satellite WIRE observed Mimosa during 17 consecutive nights and we show that the star exhibits at least five modes with amplitudes below 3 mmag, of which the main three ones are in full agreement with those found in the spectra.
Our preliminary analysis of the WIRE data shows that several non-radial modes are excited in Mimosa and that these are undetectable from ground-based photometry.
We therefore conclude that asteroseismology of supernovae-progenitors is feasible and that omitting a key-role for massive pulsators in the COROT programme would be a mistake.

1.3. Additional programmes Working Group : Progress report

Werner Weiss

A meeting of the APWG was held on Monday morning to assess the implications of the various scenarios on AP science.

Most of the time for this meeting was spent on discussing the scientific significance of observing the various groups of variable stars and the suitability of the seismology, exoplanetary and exploratory mode for that purpose.
It has been proposed to try to organise joined sessions with the three other COROT WGs, to favor cross fertilisation and to reduce the time consumption needed when attending all the various meetings.

1.4. Ground based Observations Working Group

1.4.1. Report progress

Claude Catala

In order to prepare the target field selection for the COROT mission, entry catalogues of potential targets for seismology were constructed:
* a catalogue of bright targets, validated for exoplanet search for the seismology central programme
* a catalogue of fainter targets as secondary targets of the central programme and targets of the exploratory programme.

The objective of the G/B observation working group is to accumulate data on all these targets, both in high resolution spectroscopy and in photometry, in order to characterize them.

The completion of the high resolution spectroscopic observations in the various scenarios envisaged for the orientation of the orbit plane is teh following :

scenario 1: 255 stars observed out of 661
scenario 2: 124 stars observed out of 458
scenario 3: 118 stars observed out of 792
scenario 4: 137 stars observed out of 813 (proposed during this meeting, see 2.2.1.)

Upcoming observations at ESO, with the FEROS spectrograph, which is about 20 times more efficient than the spectrographs used so far, will allow us to complete the observations corresponding to the chosen scenario in about one year.

A full description of these activities is available on the following Web page:
http://webast.ast.obs-mip.fr/people/catala/corot/corotsol.html

1.4.2. Photometric programme and delta scuti stars

Rafael Garrido

The general photometric programme

Strömgren photometry of all the stars in Scenarios 1 and 2, a total of 1105 objects, has been performed in the Observatory of Sierra Nevada during the years 2000 and 2001. Some of these stars have been also measured in Ca II line photometry in order to get a more reliable metallicity calibration.
Similar observations will be performed for the stars of Scenario 4 (see 2.2.1) which were not included in Scenarios 1 and 2.

1. *The newly discovered line profile variables*

They have been observed in photometry to check for variability and they showed no photometric variability (1 mmag rms during several hours during at least two days per object).

Only one star -HD 49434- showed long term variations, with a period higher than 6 hours. It could be a new Gamma Dor star but needs confirmation. HD 159170, used as comparison star, turned out to be pulsating in at least 4 modes. This new Delta Scuti star is rotating at 225 km/s.
It could be a very good target to study rapid rotation in pulsating stars.

The known Delta Scuti stars in Scenarios 1 and 2 are:

HD 55057=21 Mon: a very good target to study evolved Delta Scuti models.
HD 40535=1 Mon : a non very well observed Delta Scuti star. Good target.
HD 64191=AD CMi: monoperiodic Delta Scuti star.
HD 62437=AZ CMi: monoperiodic Delta Scuti star.
HD 65607=UX Mon: Eclipsing binary with a non confirmed Delta Scuti component.
HD 40372=59 Ori: a non very well observed Delta Scuti star. Monoperiodic.

The most interesting object -21 Mon- is included in Scenario 4.
Other known Delta Scuti in this scenario are not good candidates, mainly due to lack of confirmed multiperiodicity. However, it should be very interesting to check the main targets, falling in the instability strip, for photometric microvariability.
In that sense HD 174866, HD 180868, HD 50277 and HD 57749 will be monitored in Stromgren photometry during the next months at Sierra Nevada Observatory.

1.4.3. Ground-based observations for COROT/Exoplanets

Claire Moutou, Magali Deleuil, Hans Deeg et al.

The creation of the entry catalogue of COROT/exoplanet has to be started now.
It will contain basic parameters of stars in the chosen fields, including their spectral type, luminosity class, magnitude and level of contamination by (even faint) neighbour objects.
Medium-band photometry will be performed in La Silla and La Palma in 2001-2003.

On the other hand, we are searching for transits due to hot Jupiters by ground-based wide-field photometry. Frames taken during 10 half nights in La Silla 2.2m/WFI are currently being processed, using the image subtraction method.

We are confident that several aspects of the data analysis of COROT light curves will be made easier after this data set is analysed.

Part 2: The choice of the plane of the orbit and of the orientation of the CCDs

Based on the document "Preliminary work on target selection II" available at http://dasgal.obspm.fr/~michel/COROT-SISMO.html

2.1. Evolution of the constraints

2.1.1. Mission requirements

Laurent Boisnard, satellite system engineer

Transparencies can be found at http://corot-mission.cnes.fr

The main constraints to be taken into account for mission analysis are the following :
* Long duration for central program : 150 days
* Inertial polar circular orbit at an altitude between 800 and 900 km; 826 km is prefered for phase properties (orbit cycle over 7 days)
* Sun glare : observations possible when the sun is at more than 90° from the observed field
* Straylight : the line of sight must remain at more than 20° from the Earth limb

The size of the observable cone is of the order of 10°

* Roll domain : $|\alpha_z - \alpha_{z0}| < 20°$ to be validated by energy and thermal impact under study (focal block and equipment module radiators), can be useful to optimize the relative position of stars onto the CCD (to get targets out from smearing columns, for instance)
* Thermal flux / platform : the Zs- PROTEUS standard wall (battery) cannot be exposed to a thermal flux higher than 160 W/m^2 . This is not compatible with 5 months observations

Modification are proposed to reach 5 months observations (no solar flux incidence below 30°)

But a rotation on the boresight axis is necessary before or after 5 months, fitting the central / exploratory programmes observation windows.

2. Thermal flux / payload : the Ys+ satellite wall (focal block radiator) must be in the shade as much as possible. Ys+ is exposed to the sun only when the Earth is close to the line of equinoxes (low declination, high azimuth) with the module equipment passive thermal regulation. Extending the flight domain implies increasing the orbital periodic perturbations.

These constraints lead to *Only one possible scheduling of observations*

The focal plane requirements must be sent to SODERN now, stating the relative position of seismology and exoplanets CCD (left / right)

So, the orientation of the focal plane must be defined at the same time as the orbit plane.

The seismology (or exoplanets) half-field is set in both cones, with no possible rotation because of thermal flux constraints

For example : if α=6h11 , it corresponds to a seismology half-field center towards either

6h08 and 18h14, or 6h14 and 18h08.

2.1.2. Density of dwarfs in the exoplanet field

Magali Deleuil

The field of view around each star in the list of the prime seismo-targets have been characterized in term of the dwarfs density per square degree.
The cumulative number density of stars brighter than a given magnitude per square degree, has been estimated thanks to the PMM catalogue, to the east and the west of each seismo-target.
Star counts and vicinity constraints issued from close examination of POSS-I wide fields images, allowed to assign a quality factor to each pointing direction, constraining the input list.
A list has been draw up with the best FOV candidates including an estimated number of possible targets which account for the PSF overlappings and for the density of giant stars.
A rough discrimination between dwarfs and giants was made thanks to the 2 MASS data (J,H, K photometry, compared to besançon's model of the population of the Galaxy ,with the help of M. Haywood), and DENIS data (I, J, K photometry) with the help of Guy Simon.

2.1.3. Going from mv=6 to mv=6.5 for target selection. Consequences in terms of precision

Eric Michel

The target selection has initially be based on a mv ≤ 6 limit magnitude. This resulted from the scientific requirement to reach a 0.1 microHz precision on the determination of the oscillation frequencies. In order to enrich the possibilities of choice in terms of potential targets, it has been asked whether this criterion could be relaxed to mv ≤ 6.5
The noise budget tells that the photon noise limit is reached down to mv=9.
So, going from mv=6 to 6.5 reduces the signal to noise ratio for a 3ppm oscillation observed during 5 days from 5 to 4.
The Libbrecht formula shows that it slightly affects the ultimate precision that can be reached on frequency measurements. Such a small change cannot be expected to affect dramatically the performances of the Core Program, which requires a precision of ~0.1 microHz.

In fact, the precision obtained for objects of mv=8 or mv=9 are very promising for seismic studies. Eventhough, special attention should be paid to the potential targets with mv > 6.5 (say up to 7), because the precision on frequency measurement which will be reached for these objects with COROT during the 150 days runs will not be reached by any other observations shorter than 2 months, whatever the brightness of the target. This is thus one of the specific aspects of COROT possibilities and it should be exploited.

2.2. Remarks and comments of the WGs

2.1.1.Proposal of the SWG for the choice of the orbit plane

After the different points of view expressed by e-mail, before the CS6 meeting and an extra session devoted to the discussion of this point by SWG members and representatives on monday the 2d, in the evening, it was possible to reach a consensus inside the SWG.

The proposed option, *S4aW* corresponds to a centre at 102.5 deg, i.e. ra = 6h 50 min, located very near the field of scenari 3 , centered at 7h04min;

The HR Diagrams of different Scenari are available at
<http://dasgal.obspm.fr/~michel/HR_diag_Scenari.html

The associated selected configuration is :
"Exoplanet field to the West of Seismo-field, when looking at the Galactic anticenter direction",
which, at least at the moment, induces exoplanet field to the East of seismo field, when looking at the Galactic center direction.

The main points of the discussion which led to a decision (of the SWG) in favor of this option are given at http://dasgal.obspm.fr/~michel/CS6-SWG-Prop.html

The list of principal targets of scenario S4aW is
:
anticenter: HD43587, HD43318, HD46304, HD45067, HD49933+HD49434, HD55057, HD 57006

center: HD171834, HD174866, HD184663 (d~11deg. from the center)

- it contains a 1Mo object
- the "intermediate"-mass region, between 1.2Mo and 1.4Mo is well sampled in mass, as well as in evolution stages
- on the "high-mass" side, this option includes two stars, a known delta Scuti star, and an object which is not known to pulsate, but a good delta Scuti candidate.

2.2.2. Exoplanet WG

First, it must be noted that the percentage of stars classified as giant ones is only estimated in a crude way. These numbers are globally the same for the three scenarii and are only indicative ones.

Scenario 1 is the less favourable one for the exoplanet objectives. This is mainly due to the weak total star density. It offers the smallest number of choice opportunities between the pointing direction and further an imbalance between the center and the anticenter directions.

Scenario 2 is more interesting than scenario 1. The total star density is higher by a factor 1.5 . The choice in the pointing possibilities are more balanced with respect to the center/anticenter directions.

Finally scenario 3 gathers together the best fields from the previous selected scenarii. It displays quite similar star densities than scenario 2 but offers a larger number of possible pointing directions. This scenario was not accepted as it is by the seismology group which wanted to include a solar mass star in their sample of the primary targets.

In fact the small shift in the pointing direction of scenario 3, as proposed by the seismology group, does not modify significantly the advantages of this scenario from the exoplanets point of view. There are only small difference with respect to scenario 3: in terms of star counts and in terms of the ultimate choice of the pointing directions.

2.2.3. Additional programmes WG

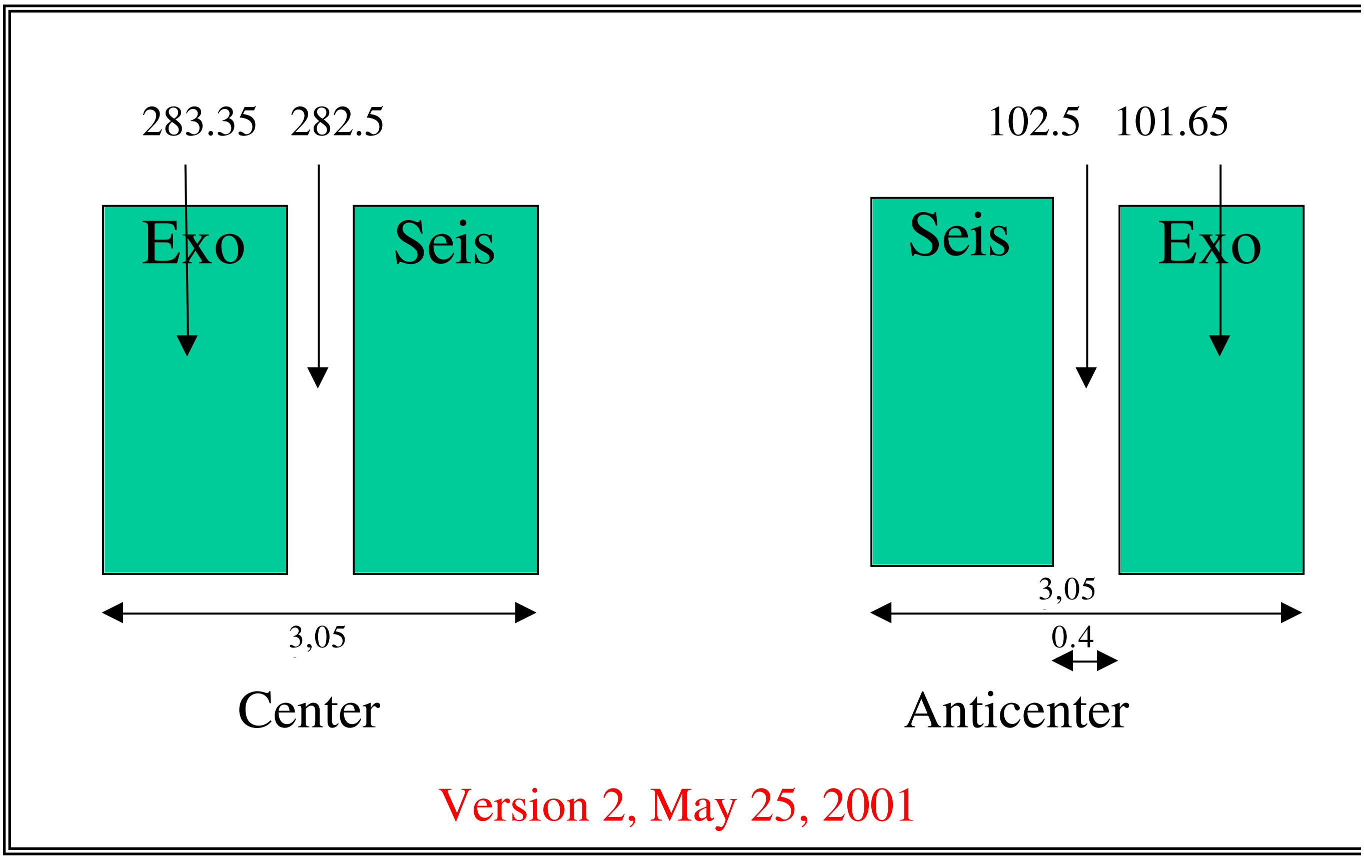
The Recommendation of the APWG are the following:

1. None of the scenarios has to be rejected
2. Scenario 1 and 3 are superior to scenario 2, except for the solar system program which favors scenario 2.
3. Some APWG members prefer scenario 3, which is second choice for the solar system program.

So the ADWG agrees with the S4aW proposition

2.3. General discussion

Following these advices it has been decided to propose S4aW as the nominal scenario of observation.
Claude Catala has provided lists of secondary and exploratory targets for the seismology field, available at: ftp mus.ast.obs-mip.fr, login anonymous, cd pub/corot/targets.



Part 3 Organisation

3.1. Public relations

Frederic Bonneau, project manager

It is very important to have a good communication during the development phase and during the observation (especially when planets will be detected).
Corot is the result of a European cooperation and we need to coordinate the communication of the partners. CNES proposes to be responsible for communication (contact Christine Correcher, Email: christine.correcher@cnes.fr) , and to coordinate a « network » of persons in charge in the different countries.
This topic will be included in the next meeting of the SC.

CNES PR actions for 2001
Artist views of Corot, Animation (to be completed)
2 mockups for exhibitions (1/4) which can be loaned
Press conference for the Steering Committee (April 24)
Corot will be at the CNES exhibit at Paris Air show (June 2001)

CNES Web server
http://corot-mission.cnes.fr, manager alain.gaboriaud@cnes.fr for technical information and public

SC web server
http://www.astrsp-mrs.fr/projets, manager Annie Baglin

3.2. The COROT weeks

It has been proposed by Werner Weiss to have the different COROT scientific meetings, coordinated as much as possible.
To do so, it has been decided to *have two COROT weeks each year*, in spring and in autumn, held in different institutes. This proposition is accepted by the SC.

A tentative agenda has been proposed for these COROT weeks:

Year	**Spring**	**Autumn**
2002	Liege	Marseille
2003	Berlin	Monte Porzio (Roma)
2004	Granada	Orsay
2005	Paris	……

The next one will be in **Vienna during week 38, September from 17 to 22.**

It will cover a general presentation of the mission and the instrument, a discussion on PR activities, a preliminary proposal for a catalogue of Additionnal targets, more on targets and fields, a preliminary list of Co-Is, and may be specific meetings of the different WGs if needed.

It is proposed to include the joint COROT/MONS meeting on target characterisation in this week.

3.3. Evolution of the definition of a Co-I

Annie Baglin

It is proposed here to modify slightly the names of the different actors in the scientific organisation of COROT, to be closer to a more classical denomination in most of the space projects.
Up to now, only the members of the Scientific Committee were the Co-Is, which means a very restricted list of scientists. The other scientists involved are presently called Associated Scientists

Some of you propose to have a Co-I membership closer to what exists often in other projects and to **extend it to the scientists which contribute significantly to the preparation of the mission.** This will give them a more important and visible status in their country, in their laboratory and a clearer recognition of their work.

A modificiation of the document "Data rights and Scientific Policy" has taken this into account.
A Co-I is a scientist, who has taken the responsibility of a task in the preparation of the mission, theoretical work, ground based observations, data reduction, preparation of the observations, instrument design…i.e.
* the coordinators of the different scientific teams in the working groups: sismo, exo and additionnal programs, ground based observations
* the scientists responsible for the instrument development, calibration, tests….the coordinators of the different tasks in the STS
* other vips!

The Co-Is will access the data during the restricted period, for the programme they propose.

The Scientific Committee will be in charge of the list . It will be reexamined regularly to adapt to the development of the activities in the project.

The role, status and rights of the *Scientific Committee* is unchanged.
The *Guest Investigators* are the scientist, not directly involved in the preparation of the project, which will be selected for an additionnal programmmes.
The *Associated scientist*s are contributing to the project in participating to a task under the responsability of a Co-I.

3.4. Date of launch

The participants expressed a strong concern about the need to have COROT in operation as soon as possible, especially because the long process of decision has already delayed the mission for at least 2 years.
In any case it is asked to the project team to maintain the schedule which leads to a launch at the end of 2004, as said in the following resolution.

RESOLUTION

COROT is scheduled for a launch in late 2004.
It will be the first mission to search for Earth-like planets
and the first European mission in stellar seismology.

*To maintain this **leading** position, in particular in view of the possible launch in 2005 of the American planet search mission KEPLER, it is essential that COROT keep to its current schedule.*

This meeting therefore calls on all participants in the COROT mission to ensure that their respective contribution are completed on, or ahead of schedule, to ensure cost effectiveness and the successful launch of COROT in 2004.