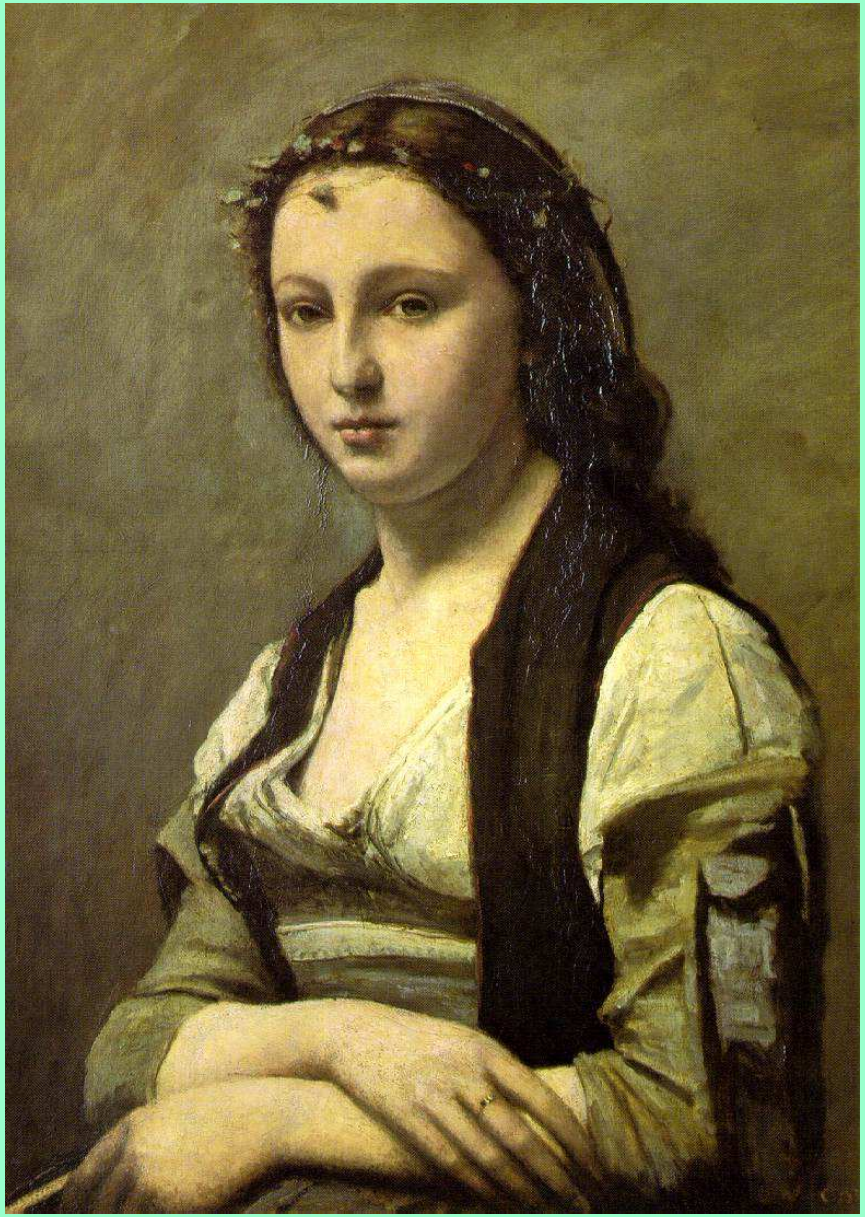
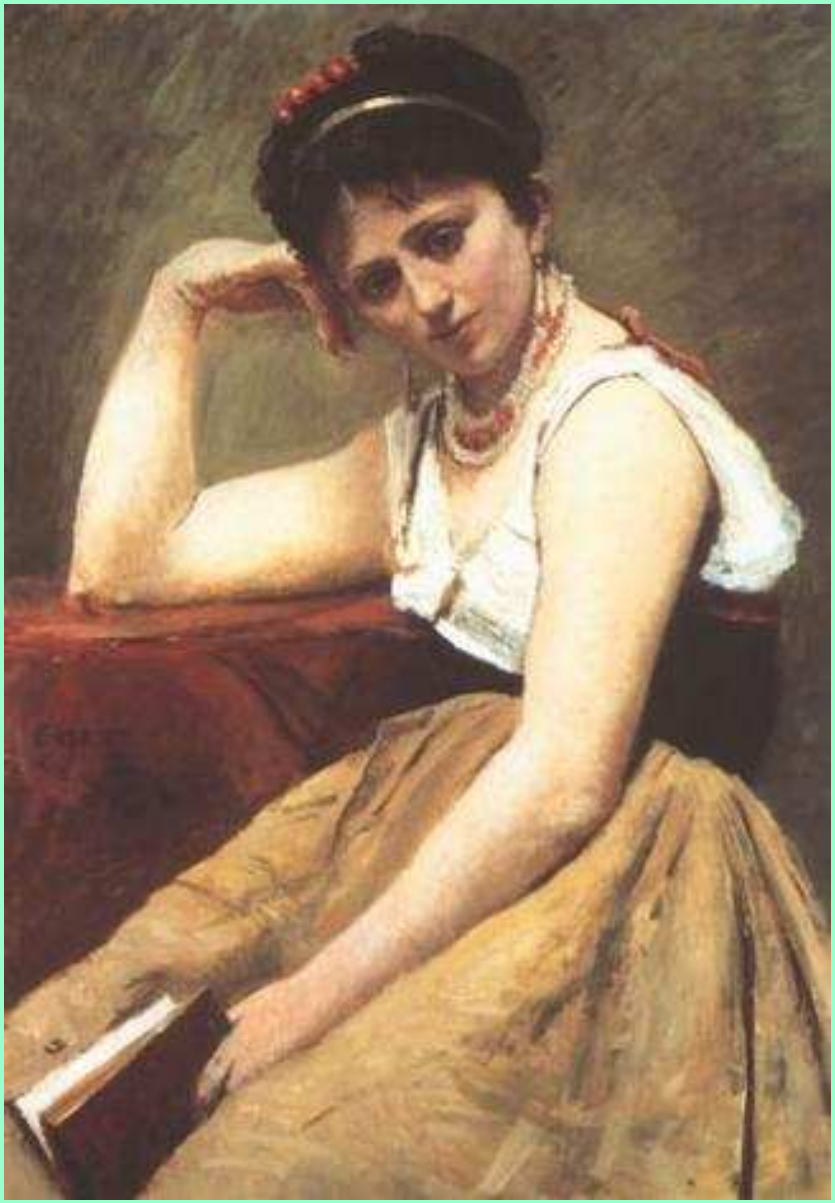


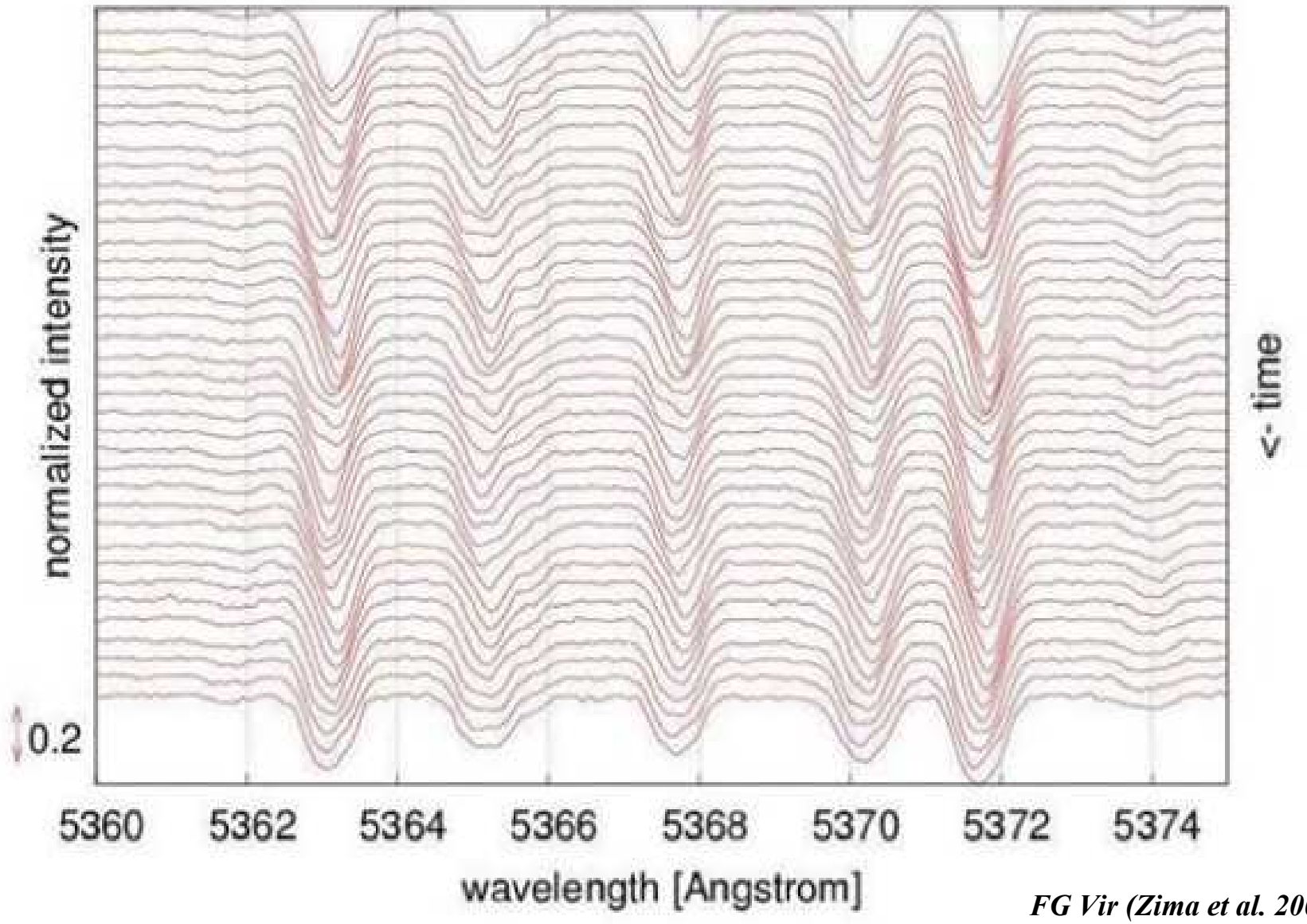


Jean-Baptiste Camille COROT (1796-1875)

Woman with a pearl (1869) ***Interrupted reading (1870)***

The ground based counterpart of the COROT observations

Ennio Poretti Katrien Uytterhoeven



FG Vir (Zima et al. 2006)

A document has been prepared after CW8 (Toulouse) to illustrate why observations of COROT fields/targets from ESO (La Silla and Paranal) are of crucial importance, both for Seismology and Exoplanet programmes.

The document has been issued at end of June 2005, and submitted to ESO DG.

Feedback (mid-September): try the usual way throughout OPC.

Large Programme on asteroseismology (Gamma Dor, Delta Sct and Beta Cep stars) was submitted on September 30th, 2005, asking for high resolution spectroscopy at FEROS.

ESO OPC didn't granted observing time in November 2005.

We decided at CW9 (Estec) to revise and re-submit the proposal at the next call, also including Be stars. Indeed, the OPC judgement strongly recommended to re-submit. We did it in March 2006, putting emphasis on multisite campaigns.

We unofficially know that the Large Programme has been accepted by the ESO OPC (June 1st, 2006)

WHY A LARGE PROGRAMME ON HR SPECTROSCOPY ?

A management motivation :

"*It is now time to accompany the CoRoT mission with the best observational ground-based efforts, in order that as much information as possible can be extracted from this huge (scientific, financial and manpower) effort that the astronomical community is underdoing*."

A scientific motivation :

"We expect that the spectroscopic results will give us a key to understand in a clearer way the photometric results"

A scheduling motivation :

"The efficient exploitation of a space mission needs to count on timely access to the data, in order to be able to finalise the science results within the 1-yr proprietary time of CoRoT data."

WHAT WE REQUESTED ?

FEROS@2.2m, two strings of 10 and 5 consecutive nights in visitor mode, separated by at least 10 days, in each semester.

> *Visitor mode is the default for FEROS. It allows us the maximum flexibility in the choice of targets and observing sequence.*

FOUR SEMESTERS (from December 2006 to July 2008). It is the maximum length allowed for a LP. We have to re-submit an updated proposal to cover 2008-2009 COROT observations.

We need for 2 observers in each semester
(or one observer doing long-run + vacations in Chile + short- run in a row ….)

Col(s): A. Baglin (Meudon Observatory, F), C. Catala (Meudon Observatory, F), E. Michel (Meudon Observatory, F), K. Uytterhoeven (INAF-OA Brera, I), C. Aerts (KU Leuven, B), P. Amado (IAA, E), M. Briquet (KU Leuven, B), M. Desmet (KU Leuven, B), M. Floquet (Meudon Observatory, F), R. Garrido (IAA, E), M.J. Goupil (Meudon Observatory, F), A.M. Hubert (Meudon Observatory, F), Y. Lebreton (Meudon Observatory, F), L. Mantegazza (INAF-OA Brera, I), S. Martin-Ruiz (IAA, E), P. Mathias (OCA Nice, F), A. Moya (Meudon Observatory, F), C. Neiner (Meudon Observatory, F), M. Rainer (INAF-OA Brera, I), F.X. Schmider (Nice University, F), J.C. Suarez (IAA, E), W. Zima (KU Leuven, B)

PROPOSAL SUBMITTED AND ACCEPTED
AT CALAR ALTO OBSERVATORY
(Centro Astronomico Hispano-Aleman)
(P.I. Pedro Amado, *IAA Granada*)

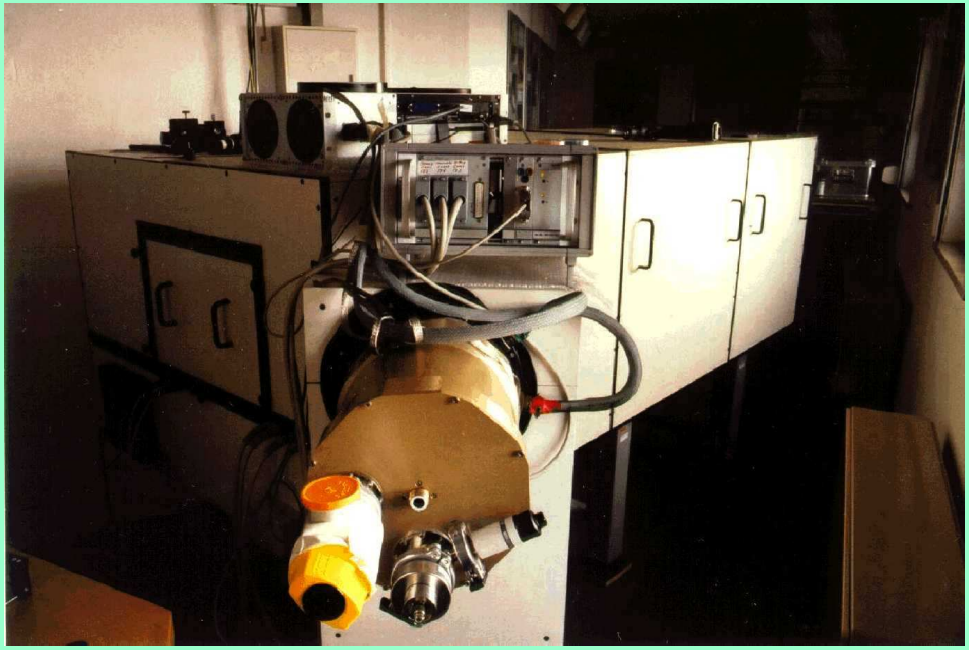
10 nights from November 30 to
December 9, 2006.

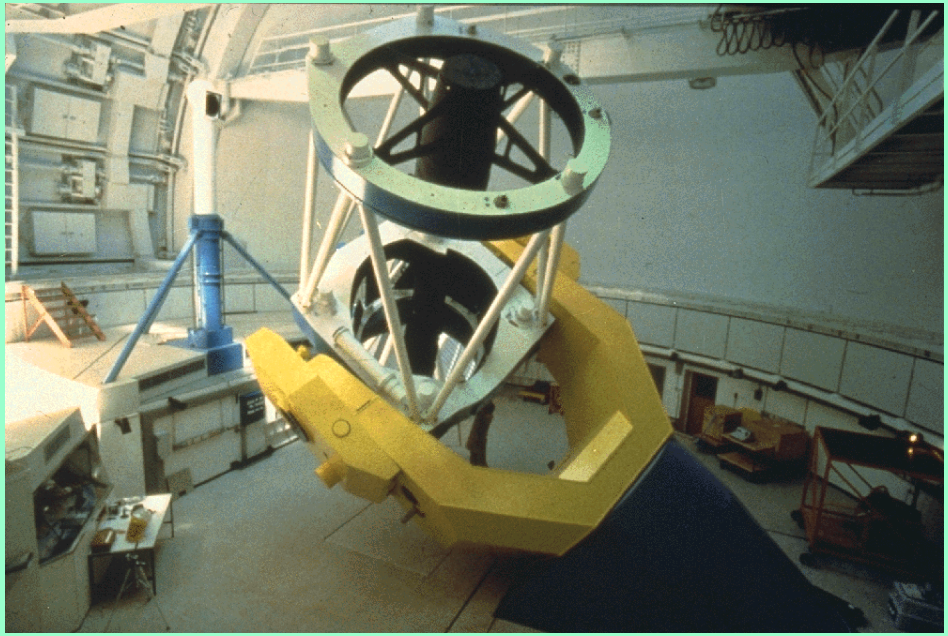
Highly rated proposal for service mode
(with additional time to complete observations if necessary),
but visitor mode also possible.

Not a large programme, it is necessary to re-submit every time.

FOCES follows a white pupil design in near-Littrow mode with two off-axis collimators and intermediate slit image.

Mounted at the 2.2 m telescope.





Theoretical *resolution maximum* with 2 pixel element is 65000 (0.015 mm pixel distance), resolution maximum optimized for throughput is **40000** (0.024 mm pixel distance).

S/N_{ETC}=170 in 25 min on a V=8.0 star
(no direct experience on this).

TARGETS FOR COORDINATED GROUND-SPACE OBSERVATIONS
Preliminary list

P78 IR1

HD 50844 DSCT 9.1
HD 50820 Be 6.2

IR2

HD 52239 DSCT 9.1

P79 LRc1

HD 180642 BCEP 8.3
HD 181555 DSCT 8.0
HD 181231 Be 8.6

SR1 (?)

HD 183324 LBOO 5.8
HD Be

SR2 (?)

HD 175337 bona-fideGDOR 7.4
HD 174966 DSCT 7.7
HD 174936 DSCT 8.6

P80 LRa1

HD 49434 GDOR 5.8
HD 50209 Be 8.4
HD 49930 Be 8.9

P81 LRc2

1° field

HD 171834 GDOR 5.4
HD 172189 DSCT 8.8

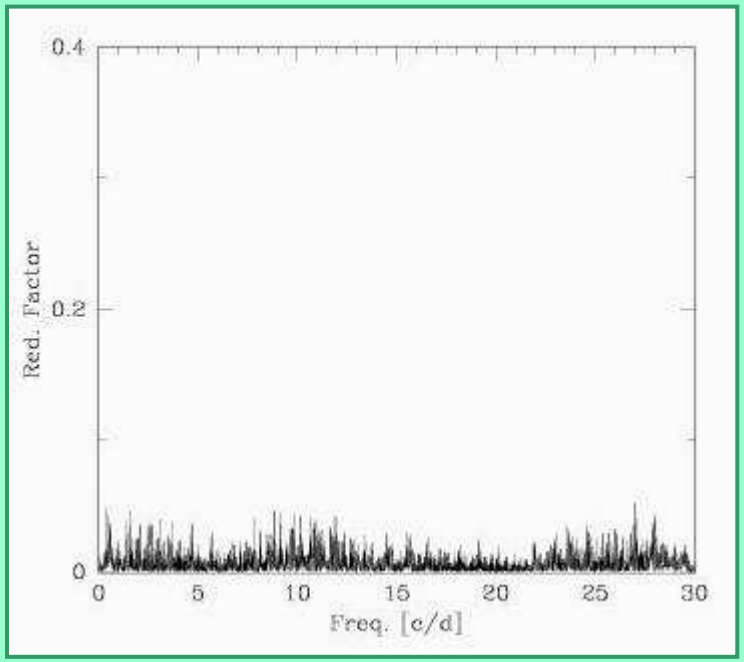
2° field

HD 170580 BCEP 6.7
HD 170699 DSCT 6.9
HD 170782 DSCT 7.8

A careful planning of the observations (which star at which site) **is mandatory**.
Bright targets can more conveniently observed at Calar Alto.
The availabilty of **SOPHIE@OHP** *(submitted proposal)* would greatly help us.

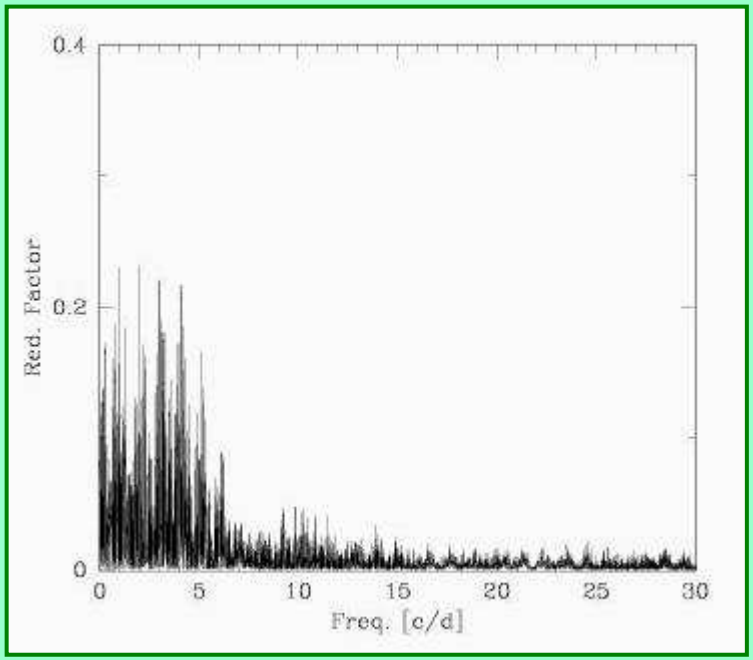
A closer look to a few targets …

HD 49933

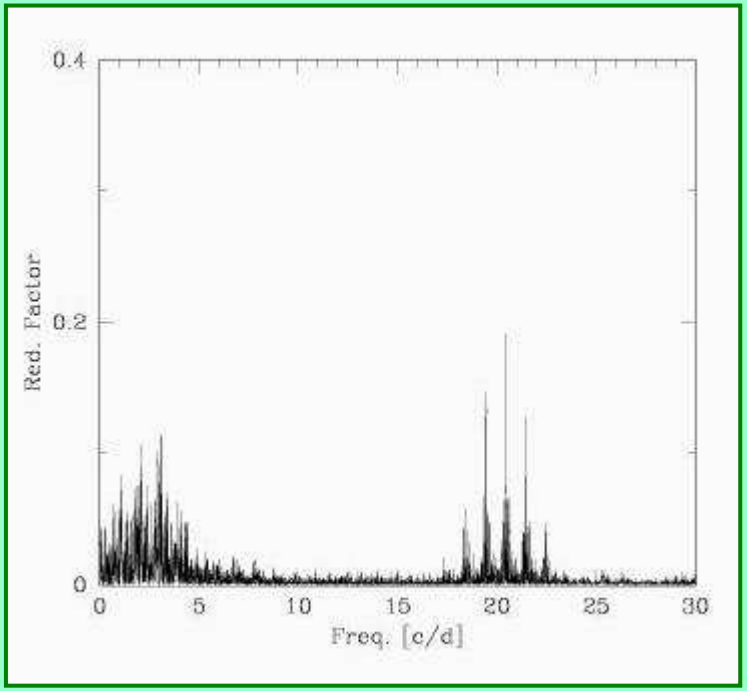


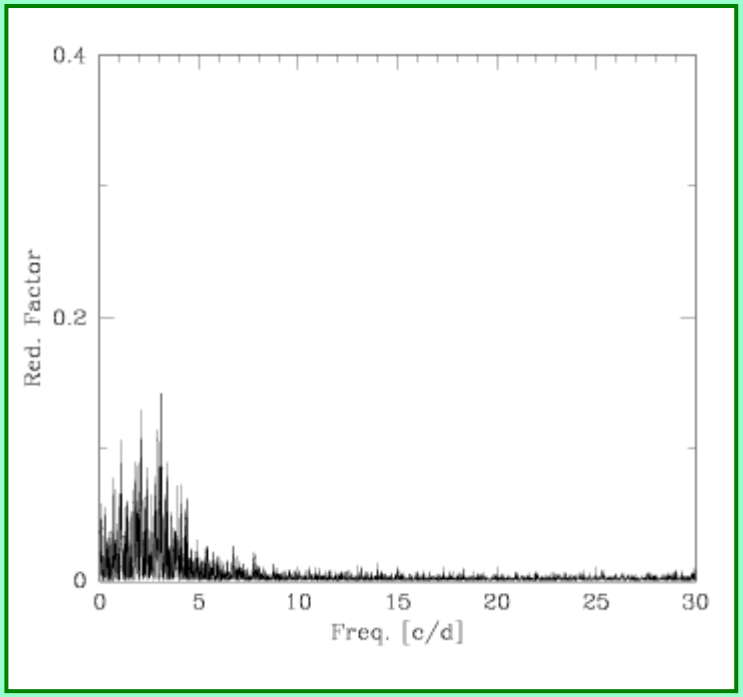
Noise amplitude [10-30 c/d] : 0.4 mmag
[0-5 c/d] : 0.4 mmag

HD 49434



Noise amplitude [10-30 c/d] : 0.7 mmag
[0-10 c/d] : 1.7 mmag
[0-5 c/d] : 2.1 mmag

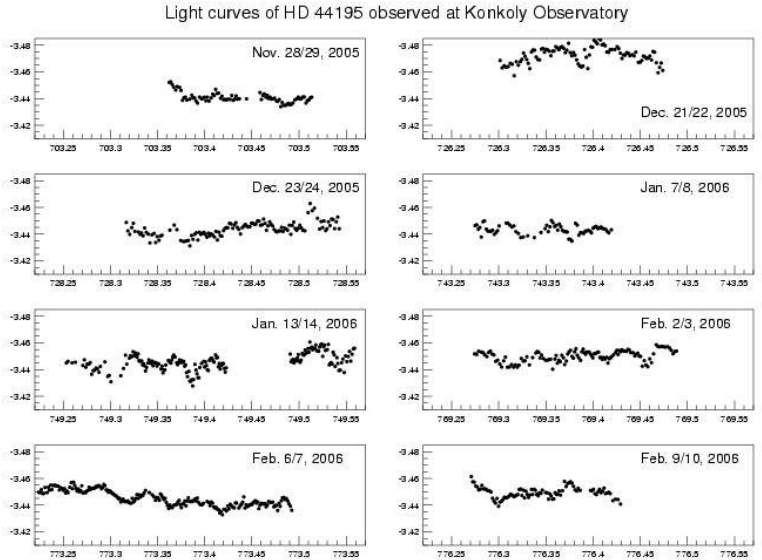




HD 44195

Hybrid variable, just one pulsation at high frequency.

Observations in past winter :
Power spectra from OSN and SPM data.
Light curves from Konkoly Observatory.



STRUCTURE PROPOSED IN THE ESO LP

(not rigid, not definitive … actually, to be improved ...)

Coordination ground-space, GB obs. scheduling : ***E. Poretti, E.Michel***

Raw data from La Silla centralized and duplicated in Brera.
First reduction of the spectra (improved ESO pipeline) : ***M. Rainer, K.Uytterhoeven***
Interaction with ***the different teams*** *for specific requests.*
External validation of the reduced spectra : ***C. Catala***

RAW, NORMALIZED AND CALIBRATED SPECTRA ARE DISTRIBUTED.
ARCHIVED IN GAUDI ?

All this structure is not necessary if each team would like to reduce the spectra of his stars by his own (open point).

Frequency detection and mode identification : ***Leuven*** *(BCEP),* ***Nice*** *(GDOR),*
Brera *(DSCT),* ***Meudon*** *(Be stars).*
Specific request from Granada team to acquire expertise on the matter.

Feedback with Brera team plus the observers for cross-checks.
Strong interaction within the whole COROT community *to ask/share specific expertise.*

FIRST RESULTS HAVE TO BE CIRCULATED/COMMUNICATED
(web pages ? meetings ? ...)
ESO OPC can ask intemediate reports on the activities

COLLABORATIONS WITH (OTHER) THEORETICIANS

PUBLICATION POLICY ***(TBD)***
MERGING BETWEEN GB AND SPACE RESULTS ***(TBD)***

Further proposals

Study of solar-like oscillations in F-G stars

ESO : HARPS

TNG : SARG *(RV mode)*

Magnetic activity of F-G stars

TNG : SARG *(spectropolarimetry mode)*

CFHT : ESPADONS

TBL : NARVAL

Interferometric observations

ESO : AMBER/VLTI