ESO/VLTI proposal Preparation

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Preparing a VLTI proposal

ESO Context

OPC STRUCTURE

Pressure

PROPOSAL EVALUATION

The ESO Form

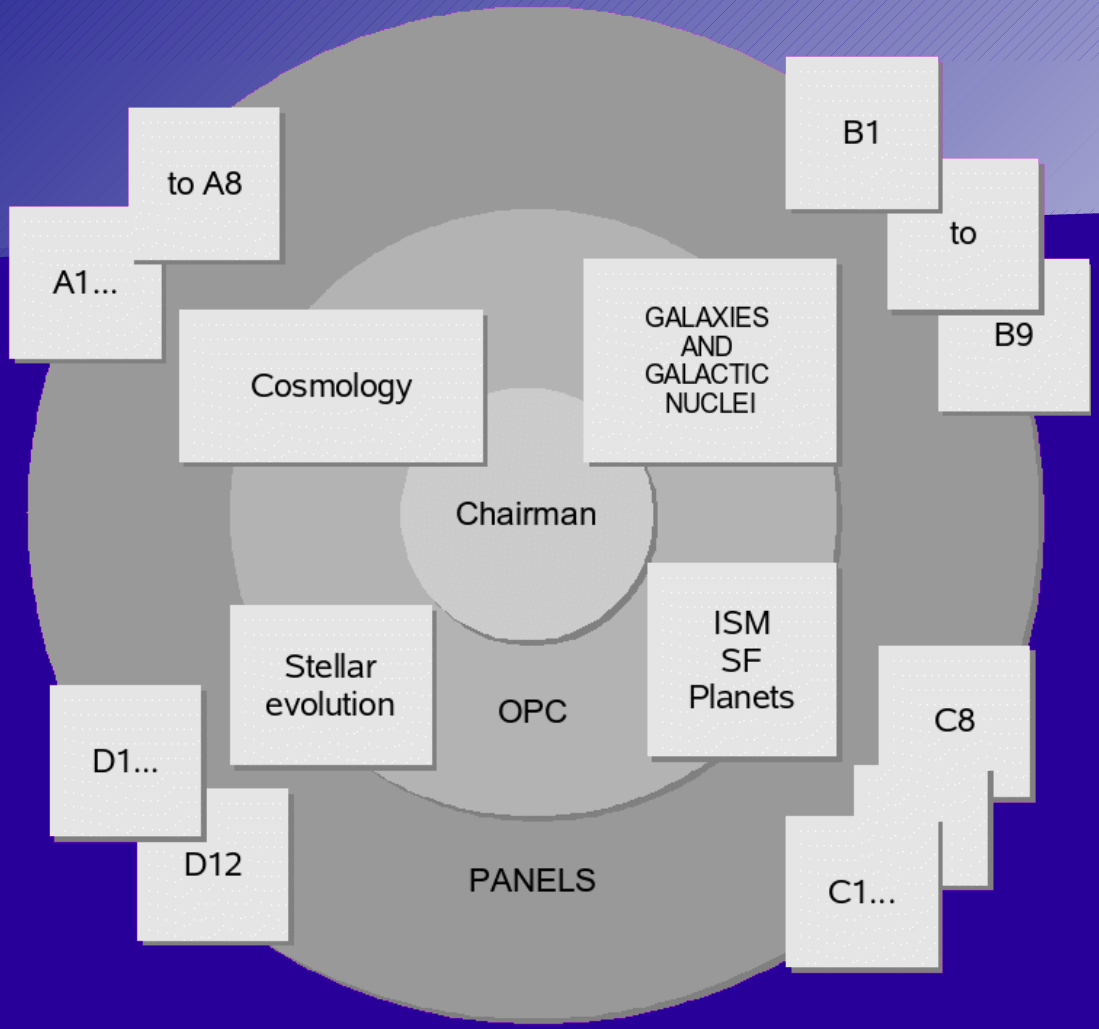
Detailed Walkthrough

Common mistakes. Recommendations.. What if...

The VLTI /interferometry special context

Behind the ESOFORM and the CFP

Observation Preparation tools examples



- Each sub panel has 1 OPC + 5 experts

OPC structure

The Observing Program Committee (OPC) advises ESO DG

Composition and selection:

- 1 national member (including Chile) per country, selected by DG from list of 2-3 names submitted by National committee.
- Chairman selected from national representatives by DG and Council president
- Members at large, experts for panels, selected by ESO in consultation with OPC chair a using suggestions from all OPC members.

ESO/OPC national members (P81)

Dr. Danielle Alloin FRANCE

Dr. Jan Brand ITALY

Dr. Jarle Brinchmann PORTUGAL

Dr. Svetlana Berdyugina SWITZERLAND

Dr. Thierry Forveille FRANCE

Dr. Roland Gredel GERMANY

Dr. Rodrigo Ibata FRANCE

Dr. Leopoldo Infante CHILE

Dr. Mika Juvela FINLAND

Dr. Donald Wayne Kurtz UNITED KINGDOM

Dr. Claudia Maraston UNITED KINGDOM

Dr. Simon Morris UNITED KINGDOM

Dr. Tom Richtler CHILE

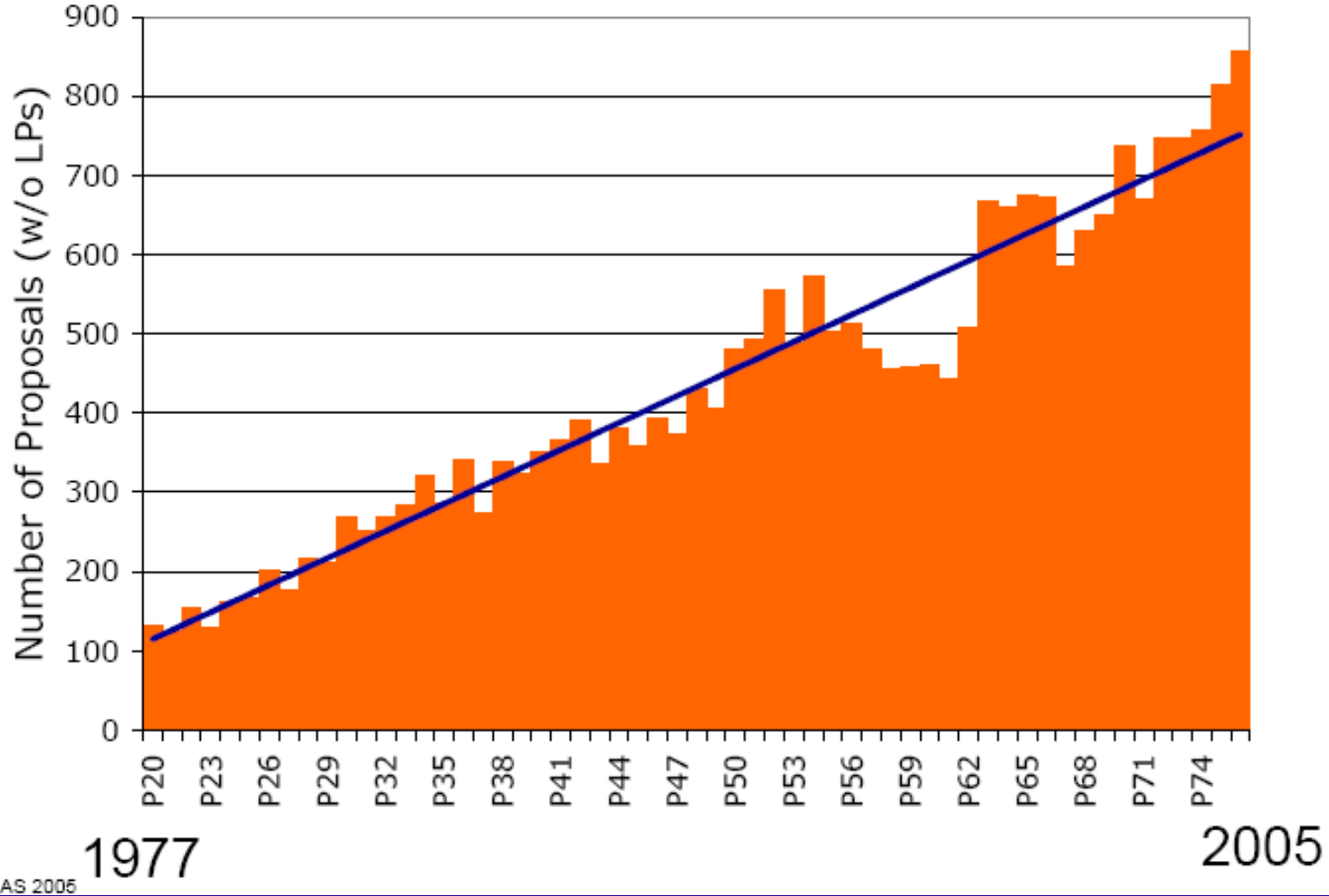
Dr. Sabine Schindler AUSTRIA

Dr. Monica Tosi ITALY

Dr. Sylvie Vauclair FRANCE

http://www.eso.org/about-eso/organisation/committees/opc/

The ESO community



ESO-VISAS 2006

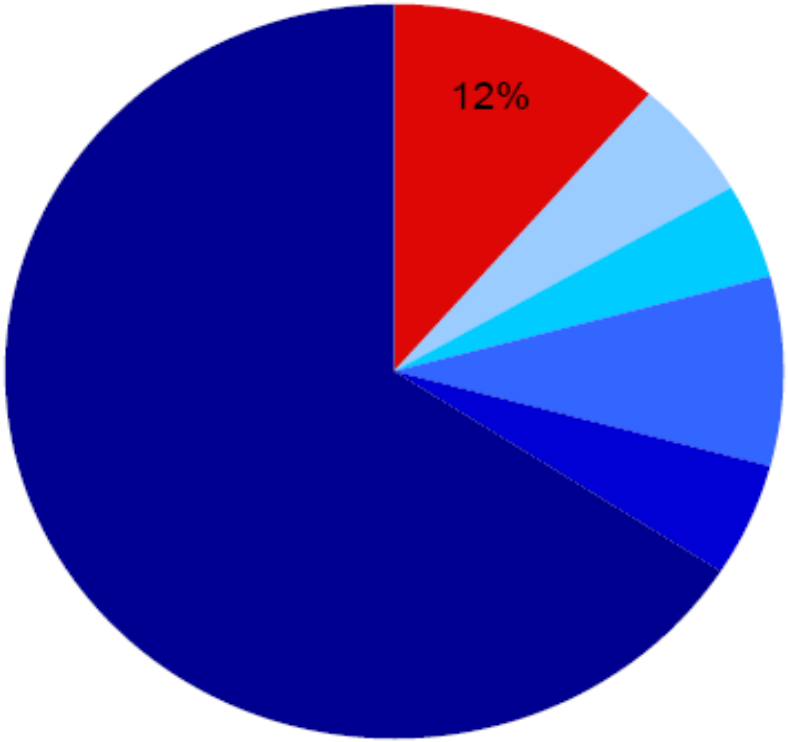
Almost every period a new record in number of submitted proposals is broken!

Priorities when scheduling the time

- Director Discretionary Time – DDT
- Large programme – LP
- Normal programmes
  - typically this is your proposal
- Target of Opportunity -- ToO

- DDT proposals should be used but they have specific criteria
  - High approval rate 50% (check ESO web)
  - Feasibility observations: prepare new observations
  - Can be applied every time
  - If a ToO doesn't exist you can react fast
  - http://www.eso.org/observing/visas/ddt/

P76 big cake: 1248 nights

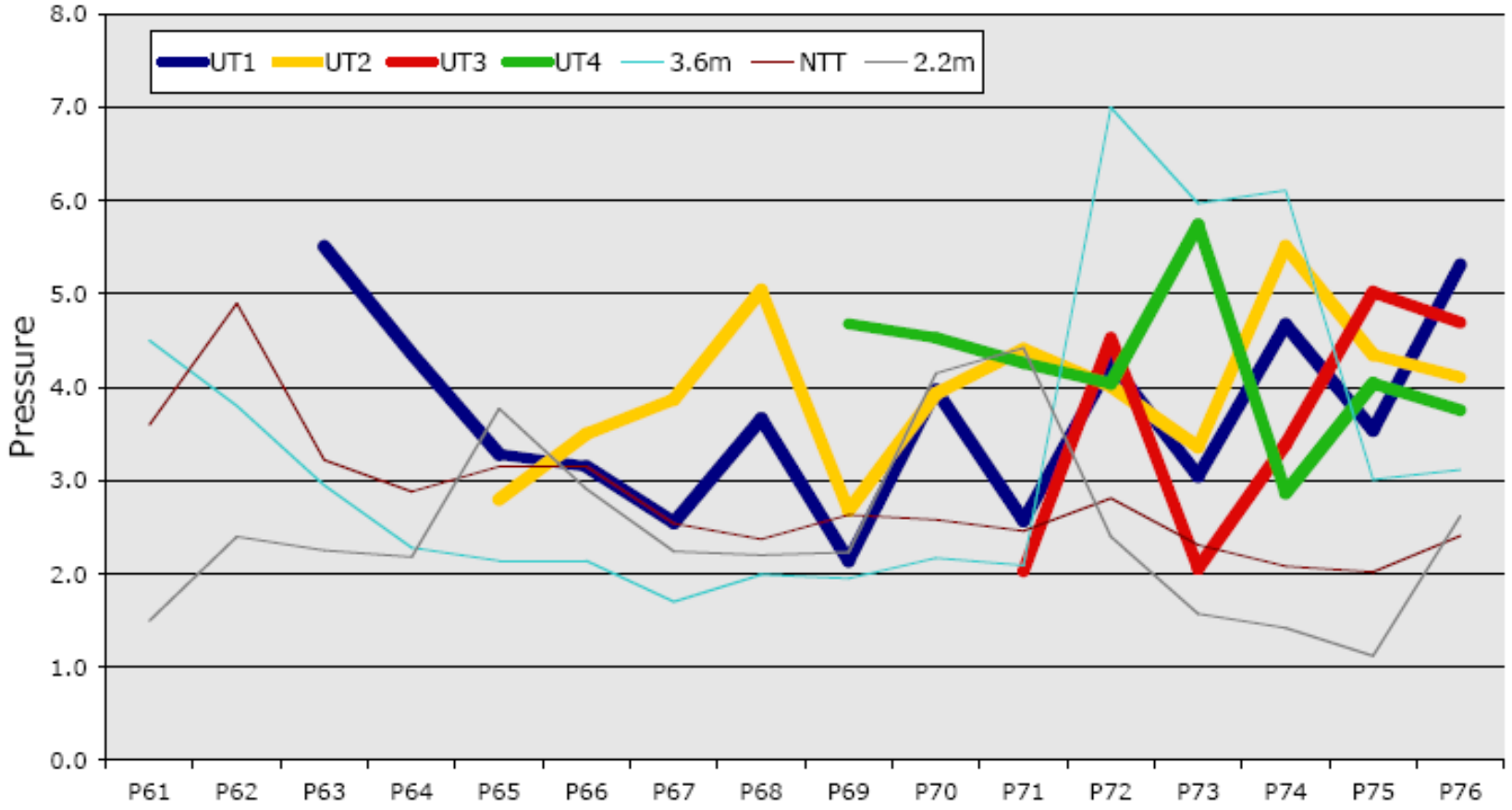


Non-science time
Calibrations
DDT (5% of Science)
GTO + SDT
LP commitments
Available to OPC76

ESO-VISAS 2005

- Non-science time: commissioning + technical time (no weather)

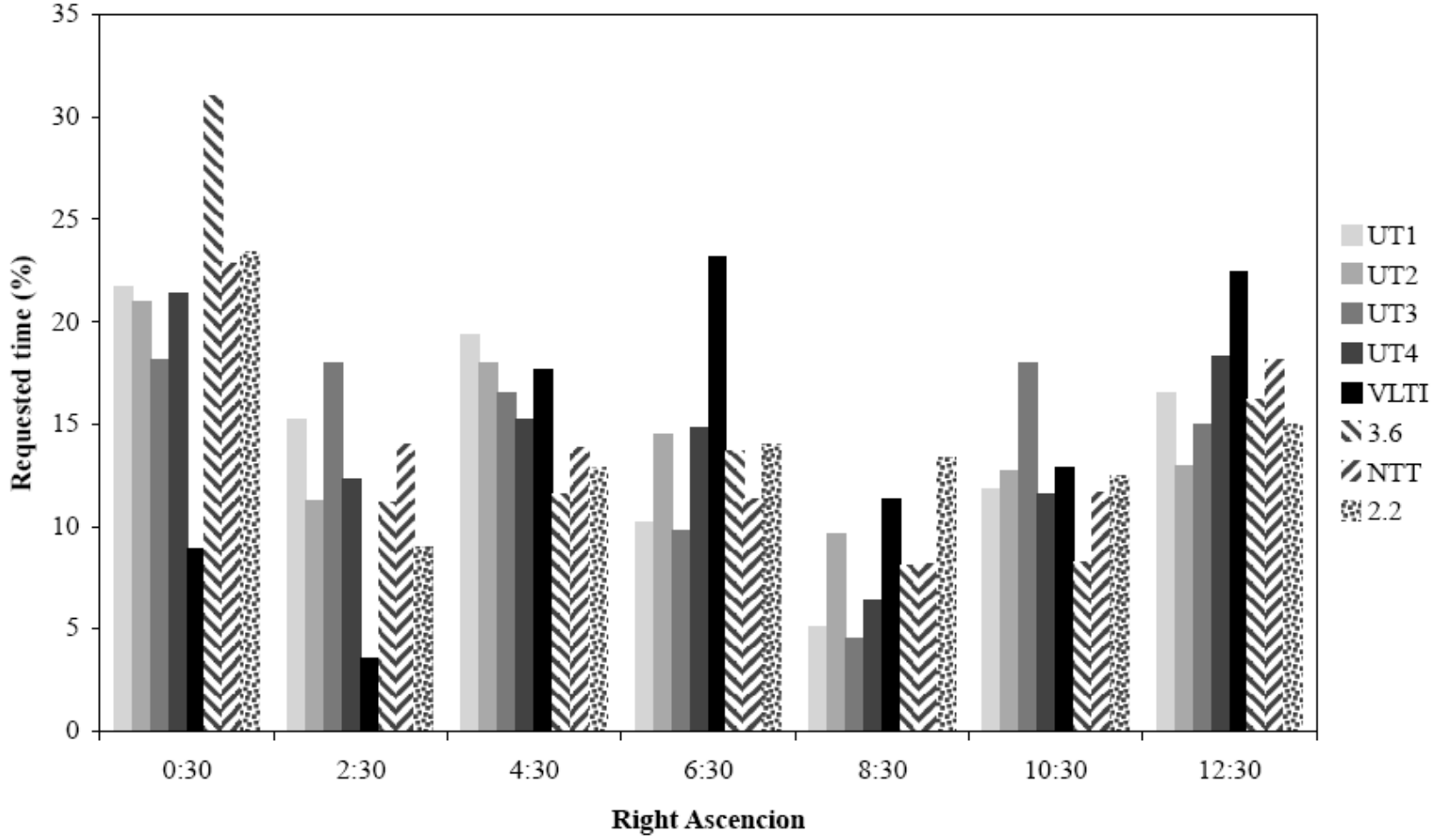
Pressure



ESO-VISAS 2005

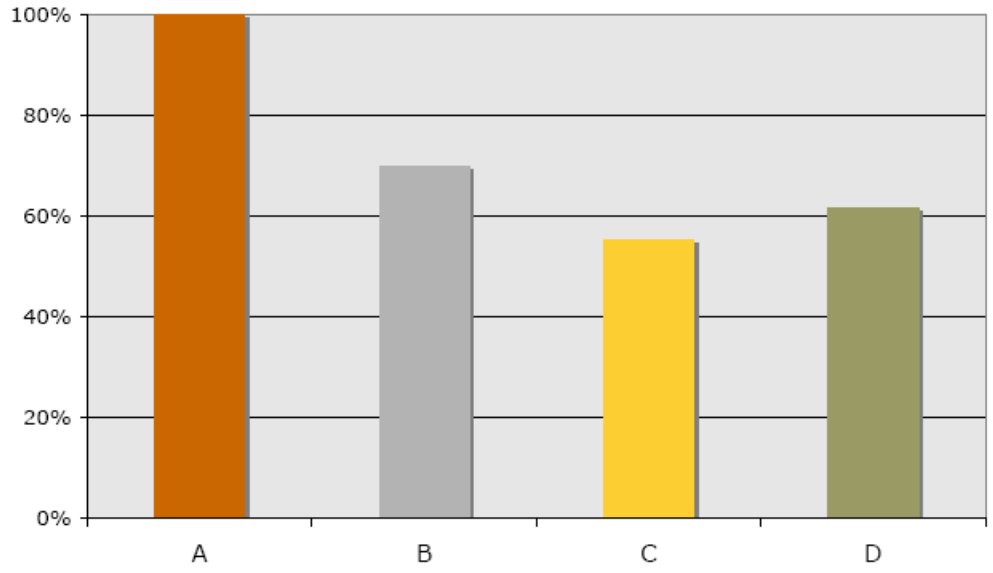
Pressure = number of nights asked / number of nights available

Pressure in function of RA

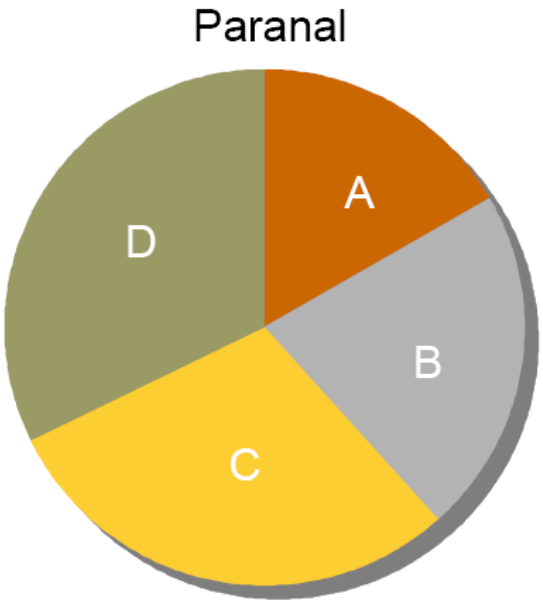


Who gets the time: equipartition

Relative program length (average)



Distribution of the number of proposals



A: Cosmology
B: Galaxies and galactic nuclei
C: ISM, star formation and planetary systems
D: Stellar evolution

Typical OPC meeting

- Each proposal has 3 referees (1 principal + 2)
- Previously to the meeting the referees send their marks and comments to the panel
- Meeting lasts for one week
  - 2 days for panels meetings
  - 3 days for OPC member final ranking
- **Each** of the 6 panel members gets
  - ~35 referee proposals
  - 60-90 per panel
- Time spent with each proposal
  - Before panel typical time is ~ 20 min
  - During panel discussions typical time is ~ 5-7 min

Typical OPC meeting

- Members of the panel have a wide expertise

C - INTERSTELLAR MEDIUM, STAR FORMATION and PLANETARY SYSTEMS

C1	Gas and dust, giant molecular clouds, cool and hot gas, diffuse and translucent clouds
C2	Chemical processes in the interstellar medium
C3	Star forming regions, globules, protostars, HII regions
C4	Pre-main-sequence stars (massive PMS stars, Herbig Ae/Be stars and T Tauri stars)
C5	Outflows, stellar jets, HH objects
C6	Main-sequence stars with circumstellar matter, early evolution
C7	Young binaries, brown dwarfs, exosolar planet searches
C8	Solar system (planets, comets, small bodies)

D - STELLAR EVOLUTION

D1	Main-sequence stars
D2	Post-main-sequence stars, giants, supergiants, AGB stars, post-AGB stars
D3	Pulsating stars and stellar activity
D4	Mass loss and winds
D5	Supernovae, pulsars
D6	Planetary nebulae, nova remnants and supernova remnants
D7	Pre-white dwarfs and white dwarfs, neutron stars
D8	Evolved binaries, black-hole candidates, novae, X-ray binaries, CVs
D9	Gamma-ray and X-ray bursters
D10	OB associations, open and globular clusters, extragalactic star clusters
D11	Individual stars in external galaxies, resolved stellar populations
D12	Distance Scale - stars

B - GALAXIES AND GALACTIC NUCLEI

B1	Morphology and galactic structure
B2	Stellar populations: unresolved and resolved
B3	Chemical evolution
B4	Galaxy dynamics
B5	Peculiar/interacting galaxies
B6	Non-thermal processes in galactic nuclei (incl. QSRs, QSOs galaxies, and LINERS)
B7	Thermal processes in galactic nuclei and starburst galaxies emission lines, and spectral energy distributions)
B8	Central supermassive objects
B9	AGN host galaxies

- Conflict of interest
  - Should be declared by the referee one week after receiving the proposals
  - If detected only at the meeting – members doesn't vote (leaves the room)
  - People normally follow this rule

Typical OPC meeting: evaluation

- Proposal discussion
  - 3 referees discuss + and – points of the proposal
  - Other members ask questions, express opinion
  - 6 members vote (referees marks may change during discussion)
- Marks: A -> C
  - 1.0 – outstanding
  - 1.5 – excellent
  - 2.0 – very good
  - 2.5 – good, should be done if time permits
  - 2.9 – limit of acceptable, lowest priority for implementation
  - 3.0 – not recommended for implementation
  - 4.0 – bad proposal, not recommended for implementation
  - 5.0 – very bad proposal, strongly discouraged for implementation

Typical OPC meeting: evaluation

- Scientific merit & the importance of its contribution to the advancement of scientific knowledge
- Evidence of
  - sufficient time and resources
  - a detailed strategy for a complete and timely data analysis
- Scientific output from previous observations
  - Reports/papers published or in preparation
- Good prospects of success
  - Not taking into account technical feasibility
  - After the OPC meeting all recommended proposals will be reviewed by ESO experts for technical feasibility
- Requests of time for completion of programs already accepted are given special consideration.
- Affiliation and nationality of the applicants should **not** influence the evaluation process

Proposal ranking categories

- **A** Programmes highly ranked
  - All possible effort will be made to execute all the OBs in the requested observing period
  - If not totally executed
    - can be declared "substantially complete"
    - carry it over to at most the next useful period
- **B** Programmes well ranked
  - Best effort will be made to execute all the OBs in the requested observing period
- **C** Filler programmes selected from below the cut-off line
  - OBs will only be executed if the observing conditions do not permit to conduct programmes A and B.

What to do

- Read very carefully the esoform + instrument manuals
- Understand how the system works
  - Call for proposals
  - OPC minutes
  - VLT/VLTI Science Operations Policy
  - Users group minutes
  - Discuss with your national representative, experienced users
  - Watch this talk
- Prepare your proposal well in advance (not when you get the call)
  - Ask you colleague in a another area to read it
- Help the panel to grade (well) your proposal

Going through the ESOFORM

European Organisation for Astronomical Research in the Southern Hemisphere

Organisation Européenne pour des Recherches Astronomiques dans l'Hémisphère Austral
Europäische Organisation für astronomische Forschung in der südlichen Hemisphäre

VISITING ASTRONOMERS DEPARTMENT • Karl-Schwarzschild-Straße 2 • D-85748 Garching bei München • e-mail: visas@eso.org • Tel.: +49-89-32 00 64 73

APPLICATION FOR OBSERVING TIME PERIOD: **82A**

Important Notice:

By submitting this proposal, the PI takes full responsibility for the content of the proposal, in particular with regard to the names of CoIs and the agreement to act according to the ESO policy and regulations, should observing time be granted

- Deadlines are 31st March and 1st October
- Correspond to semesters 1/10-31/3 and 1/4-30/9
- Period 82 (1 October 2008 – 31 March 2009)

1. Title

This Is The Proposal Title This Is The Proposal Title

Category: B–4

2. Abstract

- Title and abstract obey to the normal considerations (written skills talk)
  - Why, how (instrument/objects) and what (you get)
  - Don't forget that audience is probably less specialized than for a given paper/talk
- Categories – check the esoform users manual
  - Will define to which panels the proposal goes
    - A: Cosmology
    - B: Galaxies and galactic nuclei
      - B4: galaxy dynamics
    - C: ISM, star formation and planetary systems
    - D: Stellar evolution

3. Run	Period	Instrument	Time	Month	Moon	Seeing	Sky Trans.	Obs.Mode
A	82	FORS1	40h	nov	n	$\leq 0.8''$	PHO	s
A/alt	82	FORS2	8n=3x2+4H2	nov	n	$\leq 0.8''$	PHO	v
B	82	VIMOS	6n=6x1	dec	n	$\leq 0.6''$	CLR	v
C	82	EFOSC2	8n=3x2+4H2	feb	n	$\leq 0.8''$	THN	v
D	82	NACO	1.5n	mar	n	$\leq 0.8''$	THN	v
E	82	AMBER	6h	oct	n	$\leq 1.4''$	THN	s
F	82	MIDI	6h	oct	n	n	THN	s

- OPC can cut runs but will not change time of one run
- Identify your minimum requirements
- If you ask 2” you always get **better** than that

P76 Schedule

Of the 544 OPC recommended runs, 72* (~13%) could not be scheduled:

but 240 runs below the "cut-off" and with a grade better than 3.0 were scheduled
(why? because of localized RA pressure, extra science time from converted engineering time, smaller programs)

ESO-VISAS 2005

* Most of these programs have approved runs

- Lack of observational resources
  - Not enough time available due to weather, seeing…

4. Number of nights/hours	Telescope(s)	Amount of time
a) already awarded to this project:	NTT	4n in 76.B-1234
b) still required to complete this project:	2.2/NTT	2n/20h

5. Special remarks:

Take advantage of this box to provide any special remark using up to three lines

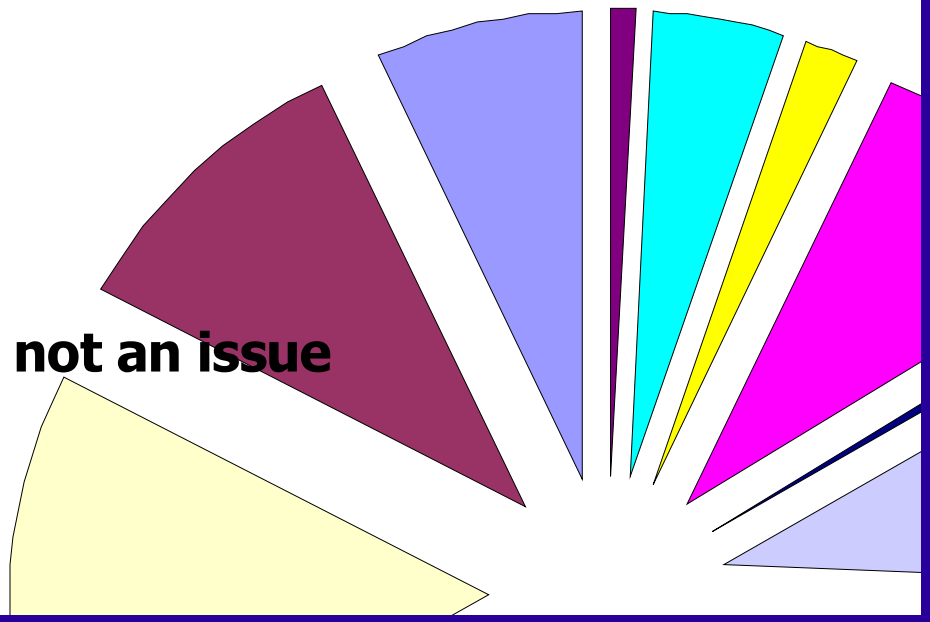
- Project means that you are going to use some previous data together with this new data in your next paper
- Don't try to trick the OPC because they will remember your last application.
- Can be used to
  - Increase objects data base
  - Obtain a few more visibilities to remove model degeneracy
- Special remarks
  - Can be used to tell the OPC that this is a resubmission of a previous well rated proposal not executed
  - Indicate the NUMBER of triggers for ToO

6. Principal Investigator: I. Name1 (Paris Observatory, F, name@obspm.fr)
Col(s): I. Name2 (Leiden, NL), I. Name3 (Geneva, CH), I. Name4 (STScI, USA), I. Name5 (ESO, ESO)

Total telescope time distribution per country

Average P74-P77

Nationality of the PI is not an issue except for Chilean.



7. Is this proposal linked to a PhD thesis preparation? State role of PhD student in this project
Yes / A. Student. Data important for PhD thesis and student will lead the project / mid-course

- This is a positive point
- First proposals from PhD student(s) will be valued
- Students/postdocs will exploit the data more rapidly

8. Description of the proposed programme

A) Scientific Rationale: Scientific rationale: scientific background of the project, pertinent references; previous work plus justification for present proposal. Scientific rationale: scientific background of the project,

- Should be written in a similar form to a paper introduction (but simpler – panel composition)
- The importance of the work in the field at large (sometimes very large) should be made clear
  - Panel composition is wide, the 6 members have to be convinced
  - Write this aspect for a specialist outside you narrow area

B) Immediate Objective: Immediate objective of the proposal: state what is actually going to be observed and what shall be extracted from the observations, so that the feasibility becomes clear. Immediate objective

- The results and discussion of the paper should be anticipated
- If you get a negative result – discuss the implications
- Feasibility must be clear – don't try to trick the OPC
  - Always identify objectively the risks and outcomes

C) Telescope Justification: Justification for the use of the selected telescope (e.g., VLT, NTT, etc...) with respect to other available alternatives.

- Not really an issue as long as instrument is unique – e.g. VLTI
- But beware of asking UT time when it can be done with ATs
- Can be an issue for those with access to Keck/CHARA/…

D) Observing Mode Justification (visitor or service): Justification for the observing mode requested (visitor or service).

- Visitor mode can be relevant (sometimes even required by ESO) if
  - observing difficult targets (magnitude/zenithal distance)
  - Some instruments/modes only work in visitor mode
  - Should be justified
  - You should ask 2 nights (but 1 night is OK)
- Service is more efficient and quality is insured – *saves 4.5 tons of CO2 as well*
  - In the call a limit is 6h but as low as 1h is OK

E) Strategy for Data Reduction and Analysis: Brief explanation of the strategy for data reduction and analysis with description of available hardware, software, and manpower.

- Mentioning that you frequent the data reduction school might help
- Find a collaborator that is experienced in the technique/data analysis

Time Justification: (including seeing overhead) Provide here a careful justification of the requested number of nights or hours. ESO Exposure Time Calculators exist for all Paranal and La Silla instruments and are available at the following web address: http://www.eso.org/observing/etc.

- Identify the minimum amount of time to achieve your goals
- Explain carefully including overheads – referees will verify ETC calculations
- Estimations that are too hand waving (1h for 1 *, 100h for 100*s)
- OPC generally will prefer to downgrade your proposal to reduce it's allocated time
- Don't be afraid of asking 1h for starting if you can already do some science (check DDT)

8. Attachments (Figures)

9. Justification of requested observing time and lunar phase

Lunar Phase Justification: Provide here the requested lunar phase. Provide below the requested lunar

- Figures are very useful don't be constrained to use them
- Not really and issue for the VLTI : Bright time

Calibration Request: Special Calibration - Adopt a special calibration

VLTI/AMBER: you may have calibration issues (but not yet handled by ESO)

10. Report on the use of ESO facilities during the last 2 years

Report on the use of the ESO facilities during the last 2 years (4 observing periods). Describe the status of the data obtained and the scientific output generated.

11. Applicant's publications related to the subject of this application during the last 2 years

Name1 A., Name2 B., 2001, ApJ, 518, 567: Title of article1

- Are you really doing science or increasing the archive volume? - archive public fast!
- Pass here the information that you are an active and efficient user of ESO facilities
- Are you an experienced ESO user?
  - If yes the probability of getting time is higher
    - as should be expected

12. List of targets proposed in this programme

Run	Target/Field	α(J2000)	δ(J2000)	ToT	Mag.	Diam.	Additional info	Reference star
ABD	NGC 104	00 24 06	-72 04 58	3.0	5	30 min	47 Tuc	
A	NGC 253	00 47 33.1	-25 17 17.8	10.0	8		Seyfert gal.	

paranal is well south...

Target Notes: The planned grid of pointings around the targets listed above will be defined during the first observing night.

12b. ESO Archive - Are the data requested by this proposal in the ESO Archive (http://archive.eso.org)? If yes, explain why the need for new data.

Are the data requested in this proposal on the ESO Archive (http://archive.eso.org)? If yes, explain the need for new data.

- Referees will verify this point carefully
- If this true and you haven't filled this point – bye, bye!
- AMBER / MIDI : data may be there but only calibrators, beware at times of the wrong names in header.
- AMBER: bad data can be archived!

13. Scheduling requirements

- Generally irrelevant, but
  - Is the moon passing near your target?
  - Are your combining with other observations?
  - Beware of over constraining, you might not get scheduled
    - Scheduling is done by software…

14. Instrument configuration

Period	Instrument	Run ID	Parameter	Value or list
82	FORS1	A	IMG	ESO filters: provide HERE list
82	VIMOS	B	IFU 0.33"/fibre	LR-Blue
82	EFOSC2	C	Imaging-filters	EFOSC2 filters: provide list here
82	NACO	D	IMG 54 mas/px IR-WFS	provide HERE list of filters
82	AMBER	E	LR-HK	2.2
82	MIDI	F	PRISM	HIGH-SENS

RTFM! – also, use preparation tools

15. List of interferometry targets proposed in this programme

Run	Name	Vmag	mag(λ)	λ_obs	size(λ)	Baseline	Vis.	mag_c	Tot
E	Alpha Ori	-1.4	-1.4	2.2	6	UT1-UT2-UT3	0.45/0.60/0.10	0.3/-0.2/4.0	2
F	Alpha Ori	-1.4	-1.4	10.6	6	G0-H0-32m	0.80	-0.9	1

VLTI Target Notes: Run E can also be carried out using the UT1-UT3-UT4 baseline.

Size – expected size (Read the CfP for more details)
Vis – is V . -> your model, or your guess?
Mag_c = mag-2.5*log10(V) – use preparation tools

Common mistakes

- Bad use of telescope time
  - Huge program with low return (probability)
- Don't take into account that panels are very wide in composition
  - Only a couple of the members are real experts in the domain
  - The proposal should very well introduce the domain
  - These members have not all followed our courses...
- Proposal too specific and with irrelevant details
- Errors that show that the proposal was done in a hurry
- Asking for too stringent observing conditions
- Unstructured proposal (use latex correctly including bolds – but do not reduce the font!)
- Figures can be very useful, even if they are not mandatory
- Submitting too much proposals

What to do when you get rejected

- Do not overemphasize the message you got
  - Messages are deliberately short, neutral and general to avoid polemic and useless critique
- Understand why you got rejected
  - Read the proposal again
  - Ask your colleague to read the proposal and give you his feedback
  - Contact OPC member/chairman/VISAS
  - Always be positive and objective during communication
- Avoid at all cost entering into conspiracy theory kind of reasoning

What to do when you get A/B but no data…

- A proposals are carried over
- B proposals can be re-submitted with a special remark (5.) on non-execution and grade
- Relax observing constrains (seeing, etc)

- Scheduling is done by software…

How to improve

- Suggested literature
  - Call for Proposals of the period you are applying
  - User's manual for Phase 1 proposals (esoform package)
  - On the writing of observing proposals, Christoffel Waelkens
    http://www.eso.org/sci/observing/proposals/writing-op.html
  - OPC minutes (not allways available)
    http://www.eso.org/public/about-eso/committees/opc/
  - Preparing an ESO proposal, by P. Kervella & P.J.V. Garcia
    http://www.vlti.org/events/assets/2/documents/3a_2.6_Kervella.pdf

- Ask the opinion of someone you respect on your final proposal draft

VLTI Specifics

The need for preparation tools

- Feasability must be known in advance
  - You must convince yourself first...
  - In order to be convincing with the OPC
- Get realistic numbers about the fitness to purpose:
  - not based on error on a single measurement point (as in ESO cfp)
  - but on the precision on model parameters (waiting the equivalent « accuracy on image reconstruction » when imaging will be available)
- illustrate with clear plots...

The need for preparation tools

- Feasability depends on many many parameters/limitations:
  - object (“model”)
  - atmosphere (pray!)
  - interferometer (geometry, delays, shadows...)
  - focal instrument (observing modes, noises) (was: ETC for ESO)
  - interferometric observable(s) to be used
  - special tricks (!)
- official infos in the CfP!
- Many possibilities to explore

Fortunately...

- There are preparation tools...
- ...which have to be used with a critical eye

- ESO viscalc and calvin:
  - http://www.eso.org/observing/etc/
- JMMC ASPRO and SearchCal
  - http://www.mariotti.fr/proposals.htm
- Aspro, VisCalc : model observables, “Exposure Time Calculator (!)”
- SearchCal, CalVin: “find” calibrators

Others.

- MPIA MIDI tools
  - http://www.mpia-hd.mpg.de/MIDI/SIMVLTI/
- MSC tools GetCal
  - http://msc.caltech.edu/software/getCal
  - between SC and CalVin
- and Vmt
  - http://mscweb.ipac.caltech.edu/vmt/vmtWeb/
  - Java “aspro-like” applet
  - KI and PTI

Note on Preparation Tools

- Preparation tools are also useful to « replay » an observation:
  - log files are incomplete/missing
  - header of files are incomplete/wrong (yes!)
  - compare obs with simple models as a starter
  - (show and even fit real data in aspro)

Note on Calibrators

- Preparation tools work on an idealized model+atmosphere. Nobody's perfect.
- with the exception(!) of closure phase, all interferometric observables will suffer from atmosphere
- ESO's “single dish” paradigm (one OB once and for all) is a nuisance in our case.
- You need calibrators, and
- You need them fast, and
- You need them numerous.

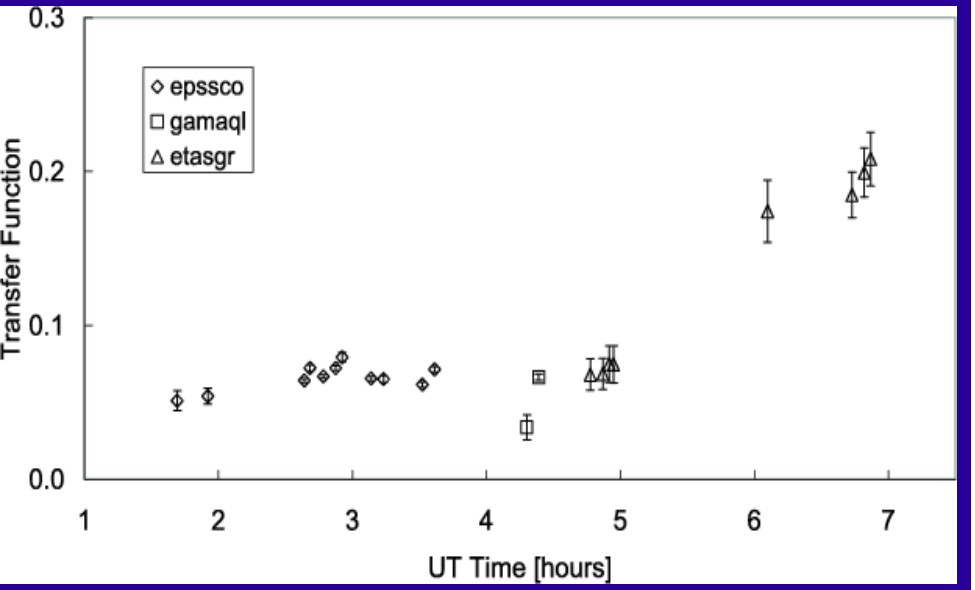
You need Calibrators

- You have looked at A. Boden's presentation in Goutelas (available on vlti.org)
- You must have objects of known visibility, observed in the same conditions as your science target:
  - near in time : atmosphere varies in time
  - near in space : elevation varies, mirrors angle change, delay lines vary...
  - near in magnitude ? instrument dependent, also AO and FT .

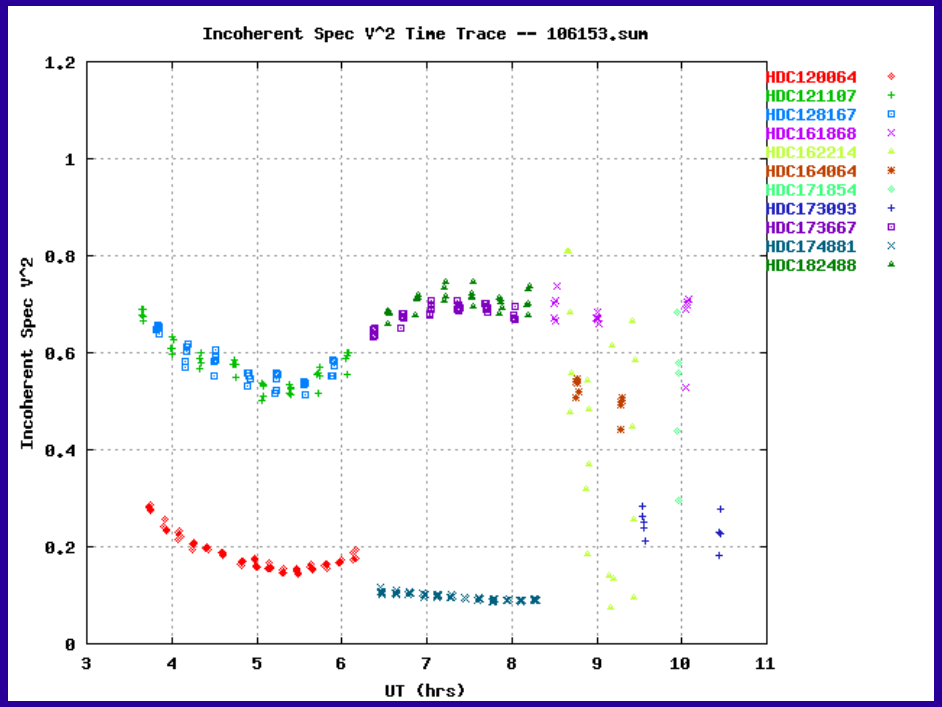
You need them fast

It is <u>critical</u> to assess and include possibility of time variability in instrument response model

VLTI/VINCI System Visibility 2001 Jul 23 & Nov 14
(Richichi & Percheron 2005 Figs 8 & 9)

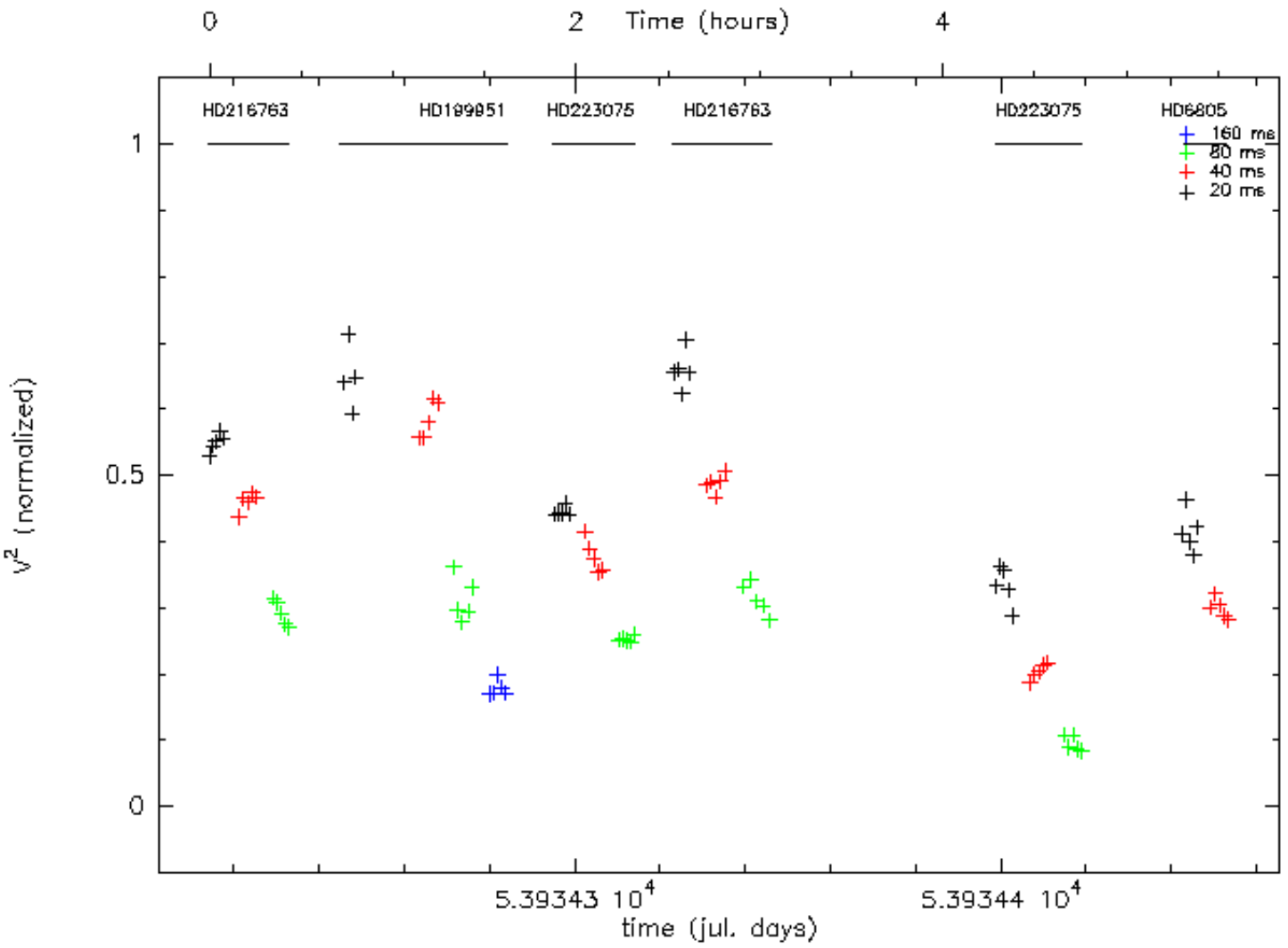


PTI Data from
2006 June 2 by A. Boden

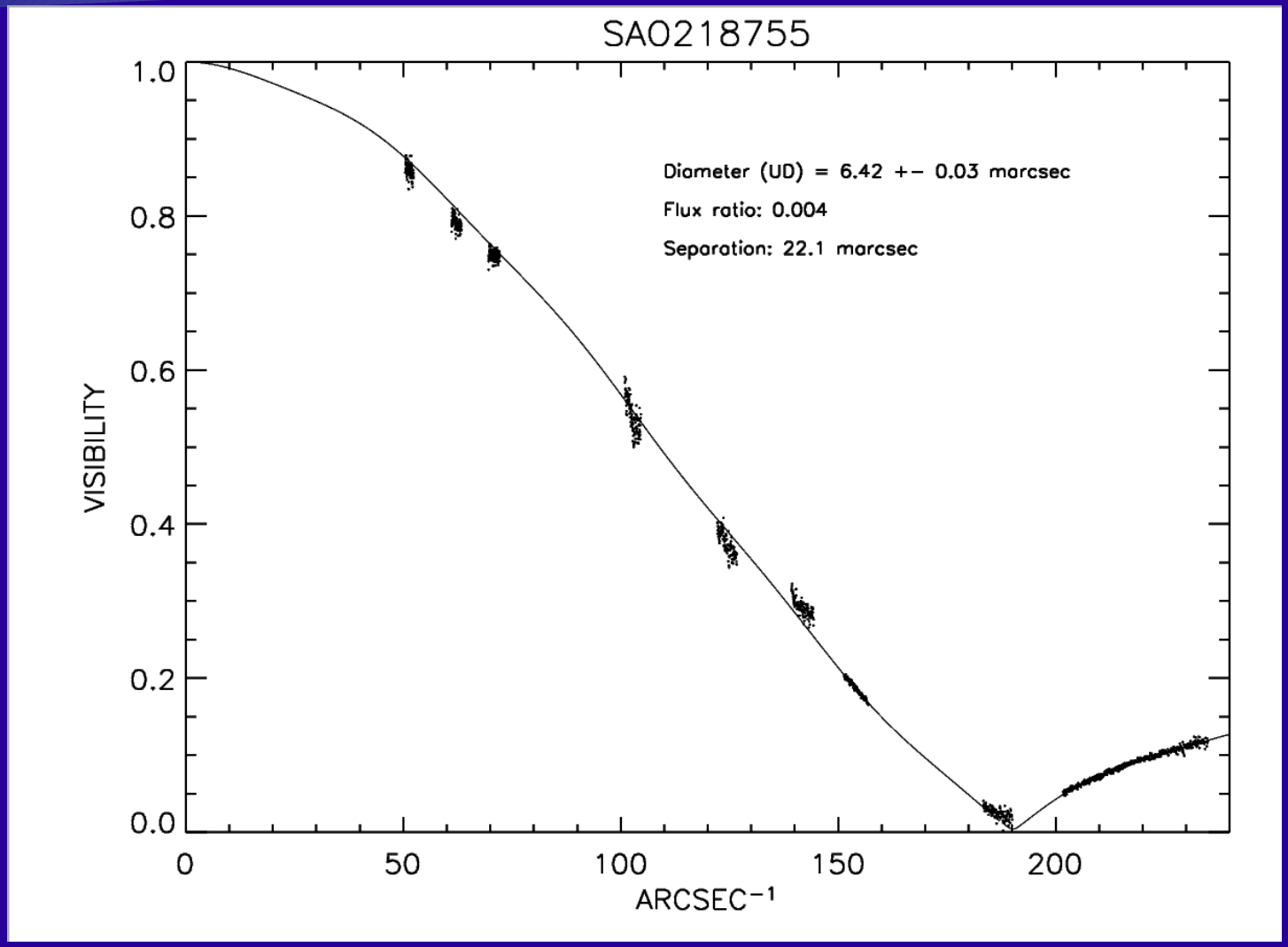


You need them numerous

- good calibrator is a point source with the flux of a non-point source, the science object: this is not physical.
- use known calibrators (but what hen layed the first calibrator?). Bright calibrators are big, and their size is known with some error. Does this additional error destroy your hopes in the accuracy of your data? Differential visibility is not V2 in this respect.
- use the best calibrator list available (SearchCal), check it against GetCal, use two of them(2/3 stars at least are double) for absolute V2 measurement, and in this case you'll need a full night of calibrators for the calibration.
- today: ask for all calibrators in the night, and insure the same calibrator for all nights!


0
2
Time (hours)
4
HD216763
HD199851
HD223075
HD216763
HD223075
HD6805
160 ms
80 ms
40 ms
20 ms
1
0.5
0
V² (normalized)
5.39343 10⁴
5.39344 10⁴
time (jul. days)

(trick, trick)


SA0218755
Diameter (UD) = 6.42 +- 0.03 marcsec
Flux ratio: 0.004
Separation: 22.1 marcsec
VISIBILITY
1.0
0.8
0.6
0.4
0.2
0.0
0
50
100
150
200
ARCSEC⁻¹

ESO's "paradigm" evolves

- VISA (ATs) used all year long look like a "real" interferometer.
- Starting next year, scheduling should avoid different observing modes in the night -> for AMBER
- Calibrator list checked beforehand by dedicated "technical" time
- Full nights of calibrators
- Finito data available

progress towards good "absolute"

calibration and merging of different observables

from various interferometers

Practice Session