

# VLT Science Demonstration

Ringberg Workshop

September 2, 2003

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# Overview of SD

- allocation: 60 UT nights (i.e., 30 x 2 UTs)
- profile of programs: outstanding science, self-contained, ground-breaking
- SD team with representatives of all VLT/IVT contributors
- first meeting September 2000
- rules established April 2001
- latest meeting (5<sup>th</sup>) March 26, 2003

# SD Team (current)

- Glindemann (ESO)
- Herbst (Heidelberg)
- Lattanzi (Turin)
- Leinert (Heidelberg)
- Lutz (Garching)
- Malbet (Grenoble)
- Paresce (ESO)
- Preibisch (Bonn)
- Queloz (Geneva)
- Richichi (ESO)
- Röttgering (Leiden)
- Schöller (ESO)
- Sol (Paris)
- Stee (Nice)
- Waters (Amsterdam)

Former Members: Lagrange, Vacca

# Status of SD Proposals

- First round (SD1) concluded in 2002. MIDI only. Six nights allocated in P71 (June 2003). Subsequently reduced to 3 nights after “loan” to MIDI GTO.
- Second round (SD2). MIDI. also AMBER included at first, then withdrawn. 9 MIDI programs submitted for approval. Request: 7 nights in P72. Allocation: November 6-9, February 8-10.
- SD3 deadline is approaching. 40 UT nights left.

# SD1 Summary

- 6 programs approved for execution with MIDI and UTs in P71 (see page), 126 visibility points
- 6 nights allocated in June 2003. Reduced to 3 after compromise with MIDI GTO.
- Configuration: MIDI, UT1-UT3 (102m), no AO, no FT, no VCM, sensitivity at least 9Jy, about 1 hour per calibrated visibility.
- Practical experience after 2 commissioning runs with MIDI led to new prioritization of SD1 programs (25 visibility points at high priority, slightly underfilling 3 nights). Full plan for 3 nights, possibility to overfill as needed.
- Presence of several SDT members on Paranal, thanks also to concurrence of MIDI paranalization and GTO.

# SD1 High Priority Targets

1. Probing the disk of Be and B[e] stars with MIDI.  
Herbst, Heidelberg (PI), Alf Ara
2. A study of disk structure around Herbig AeBe stars  
Waters, Amsterdam (PI), HD 179218
3. Young stars  
Malbet, Grenoble (PI), 51 Oph
4. Resolving the dust shells surrounding red giants  
Preibisch, Bonn (PI), RR Sco, IRAS 17004-4119
- (5) MIDI Observations of the heart of AGN: probing the dusty torus  
Rottgering, Leiden (PI), NGC 1068  
(a daring attempt for June!)

## Observations June 14,15,16, 2003

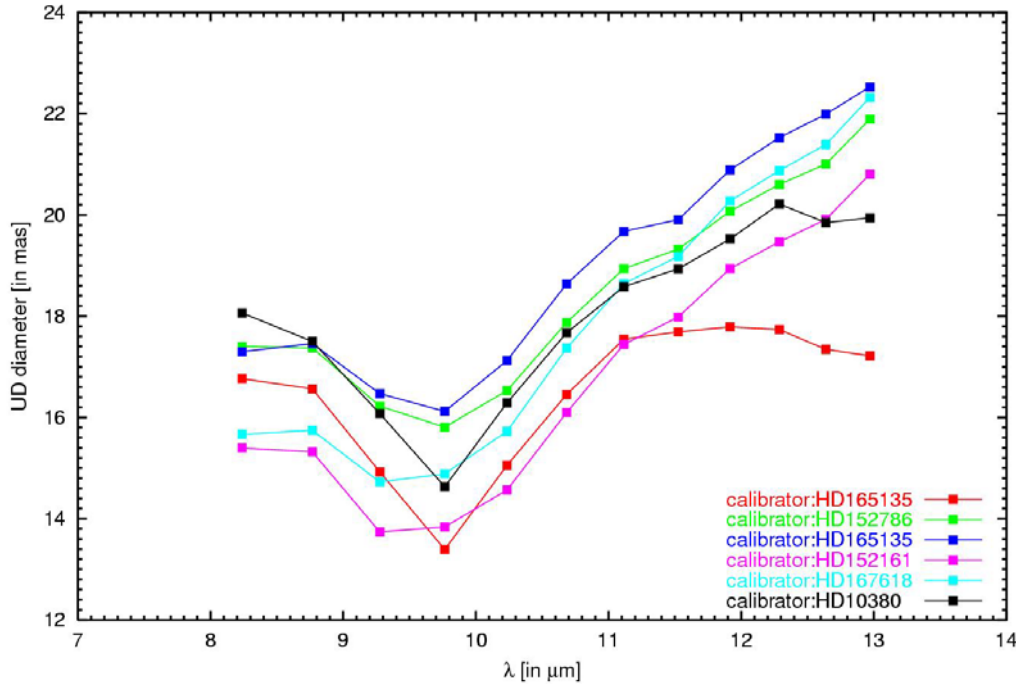
# SD1 High Priority Targets (ctd)

	Subject, first author	Objects In June	Visib points	Hours Obsver	N mag or flux	Spec Res	Visib, Visib Accuracy	Req. vis points High priority	Req. vis points backup	SD2
1	AGN (Röttgering)	0 <b>1</b>	0 <b>5</b>					0	0	yes
2	Be B[e] (Chesneau)	2 <b>1</b>	5x2 <b>2</b>	All night	1.4mag, 1.6mag	Asks for 230, could 30 be ok?	Exp 80%, visb acc 10% ok	5	5	
3	HAeBe (Waters)	2 <b>2</b>	5x2 <b>2+3</b>	1 full night (faint), 1 half night (bright)	23Jy, 7Jy	30	Vis ~40%, needed accuracy <=10%	5	5	yes
4	YSO (Malbet)	2 <b>2</b>	5x2 <b>5+3</b>	Full night	11, 15Jy	30	50% expe, 10% ok	5	5	Yes
5	Red Giants (Preibisch)	4 <b>2</b>	5x4 <b>6+0</b>	Full night, 1 obj 2 hrs only	128Jy, 700Jy	230	Doable, needs <=10% acc	10	10	No
6	Two dwarfs (Thevenin)	2 <b>0</b>	3x2 <b>0</b>	Good part of night	-1.6mag, -0.6mag	30	50-80%,10%acc is not enough but first-time	0	6	no
			<b>26</b>					25	31	

all with prism (R=30). Some "pipeline" and "on-line" data analysis

# SD1 Results – RR Sco

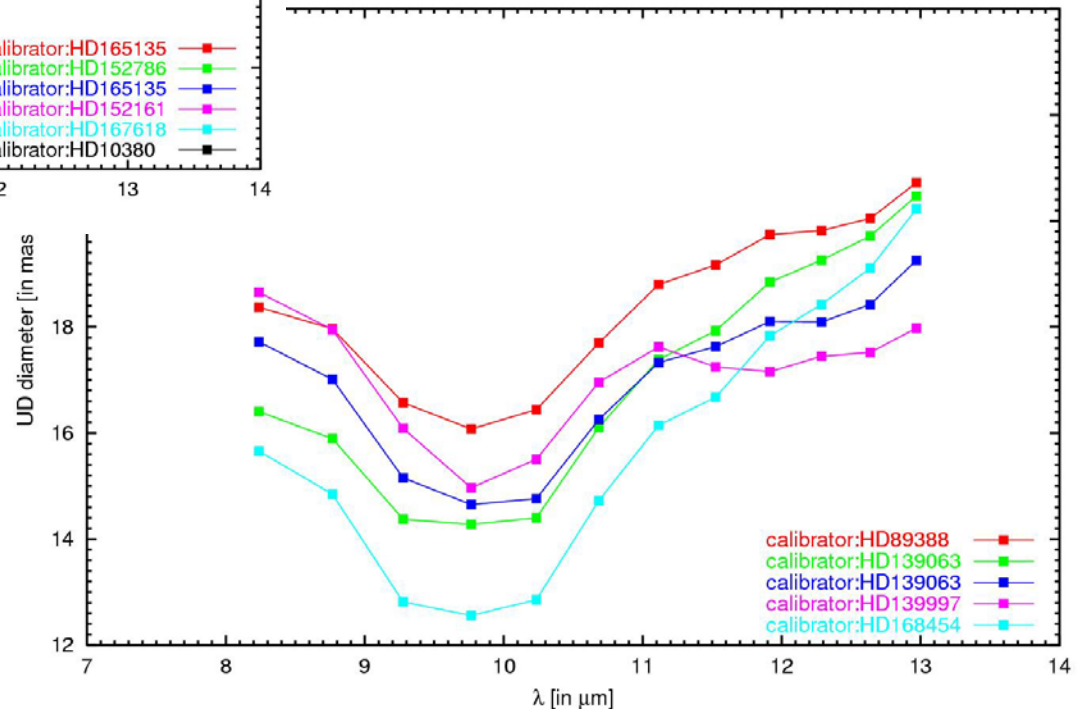
wavelength dependency of the uniform disk diameter of RR Sco, night = 2003-06-15



Dip possibly caused by H<sub>2</sub>O and SiO emission for  $\lambda < 9\mu\text{m}$ , and dust for  $\lambda > 11\mu\text{m}$

Preliminary analysis  
by Th. Preibisch

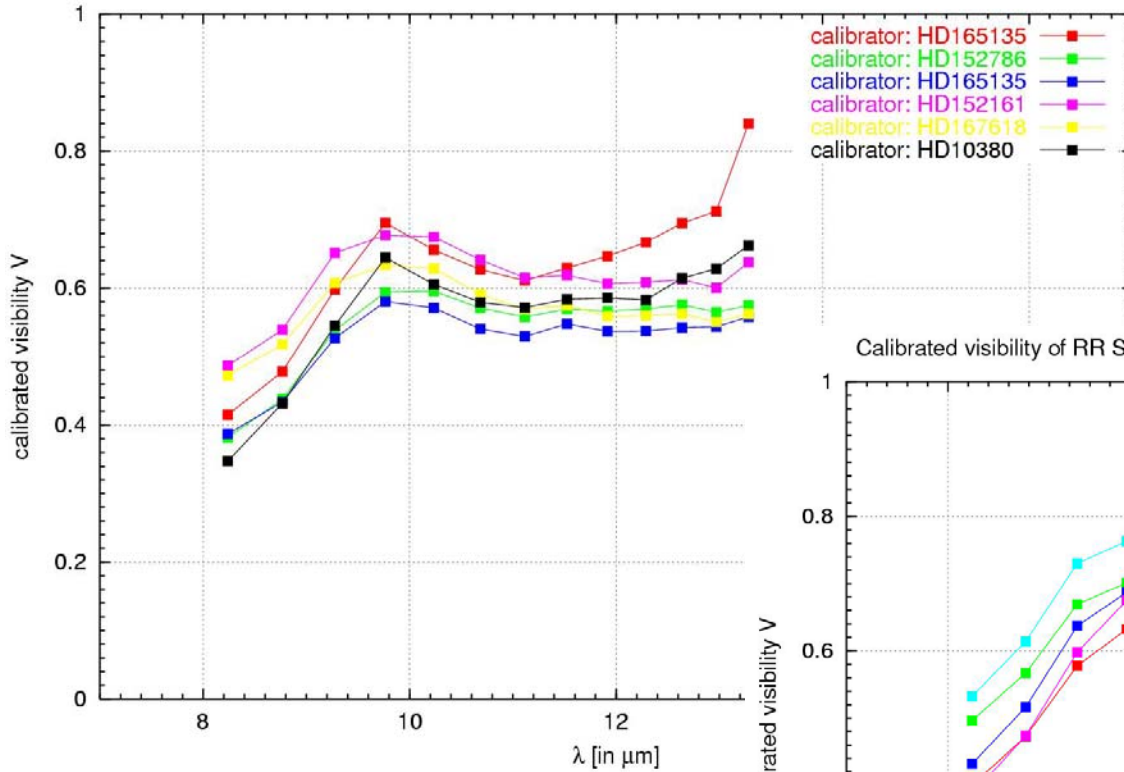
wavelength dependency of the uniform disk diameter of RR Sco, night: 2003-06-16



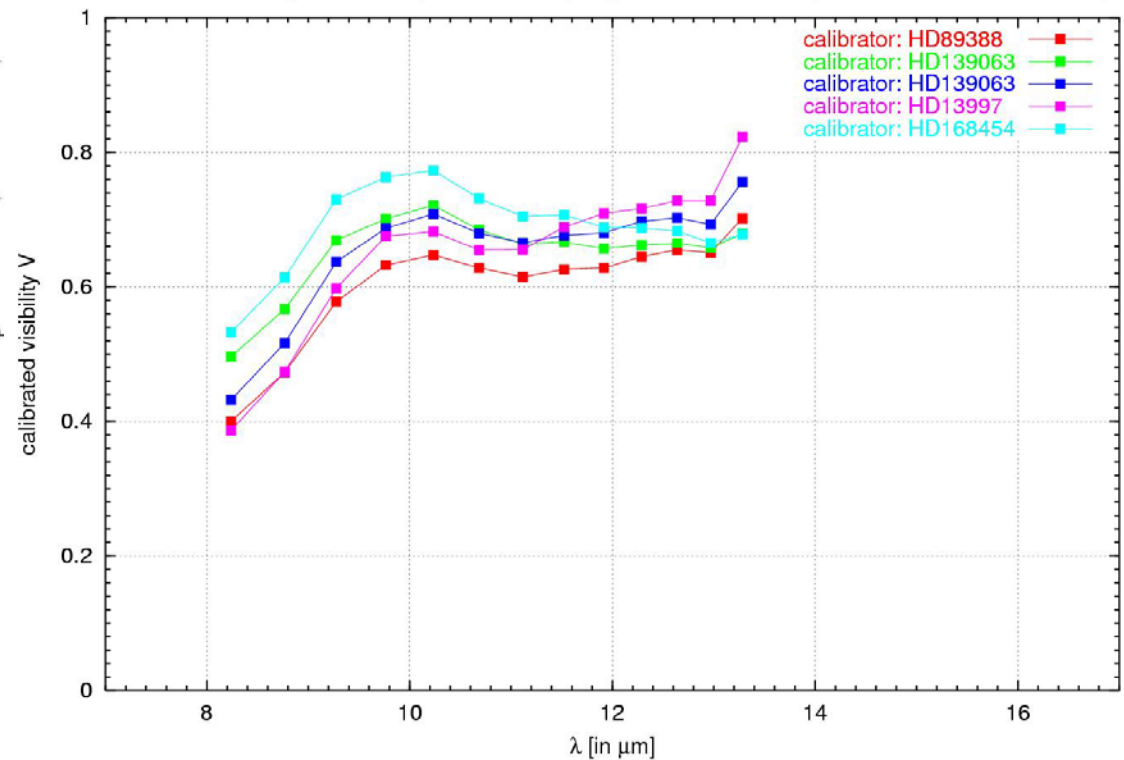


# SD1 Results – RR Sco

Calibrated visibility of RR Sco (T07:53:18.000), night = 2003-06-15 - Bp=80.409 m, PA=98.311 deg



Calibrated visibility of RR Sco (T08:24:01.000), night = 2003-06-16 - Bp=73.881 m, PA=101.810 deg

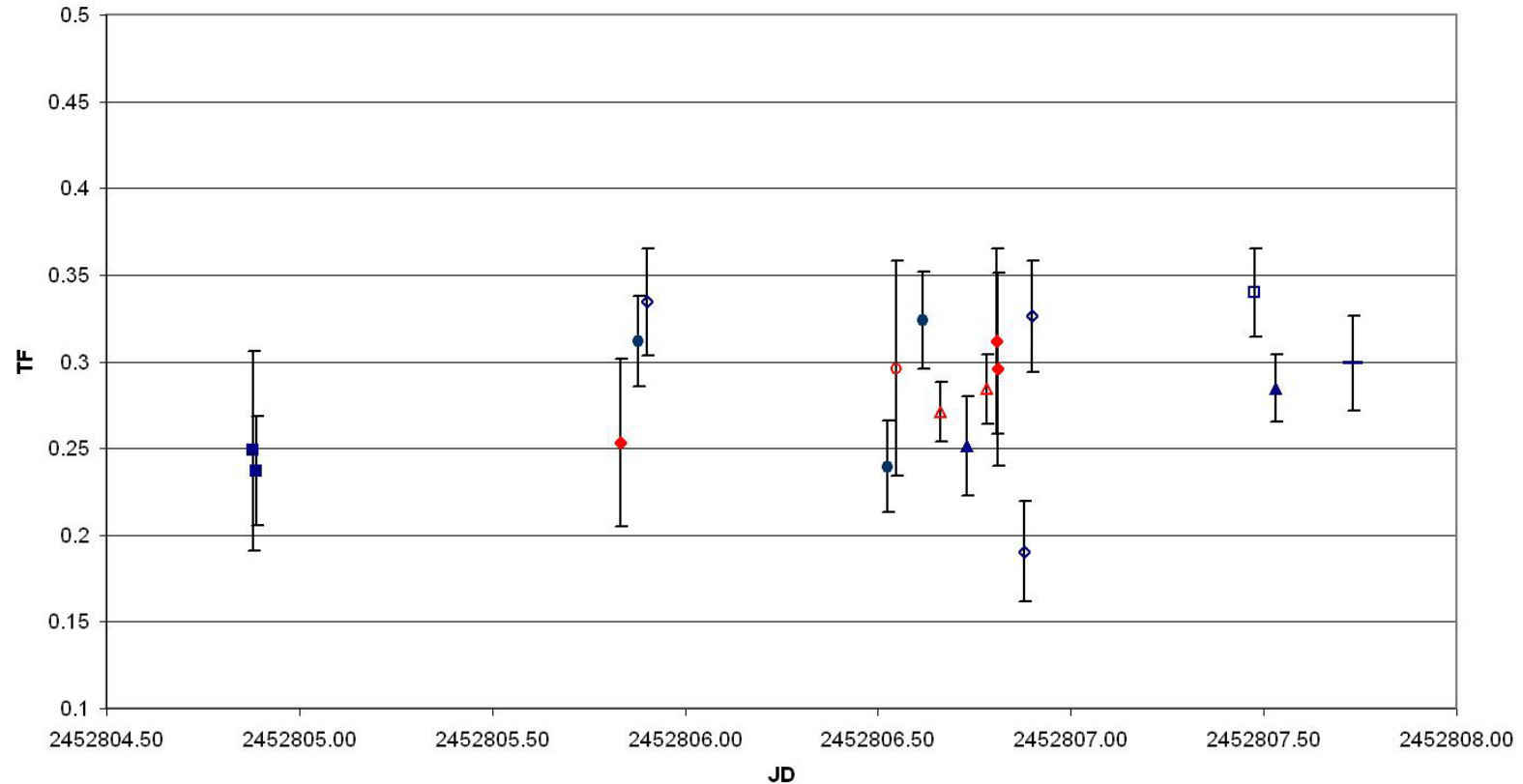


Very consistent and stable transfer function.

# SD1 Transfer Function

hart Area

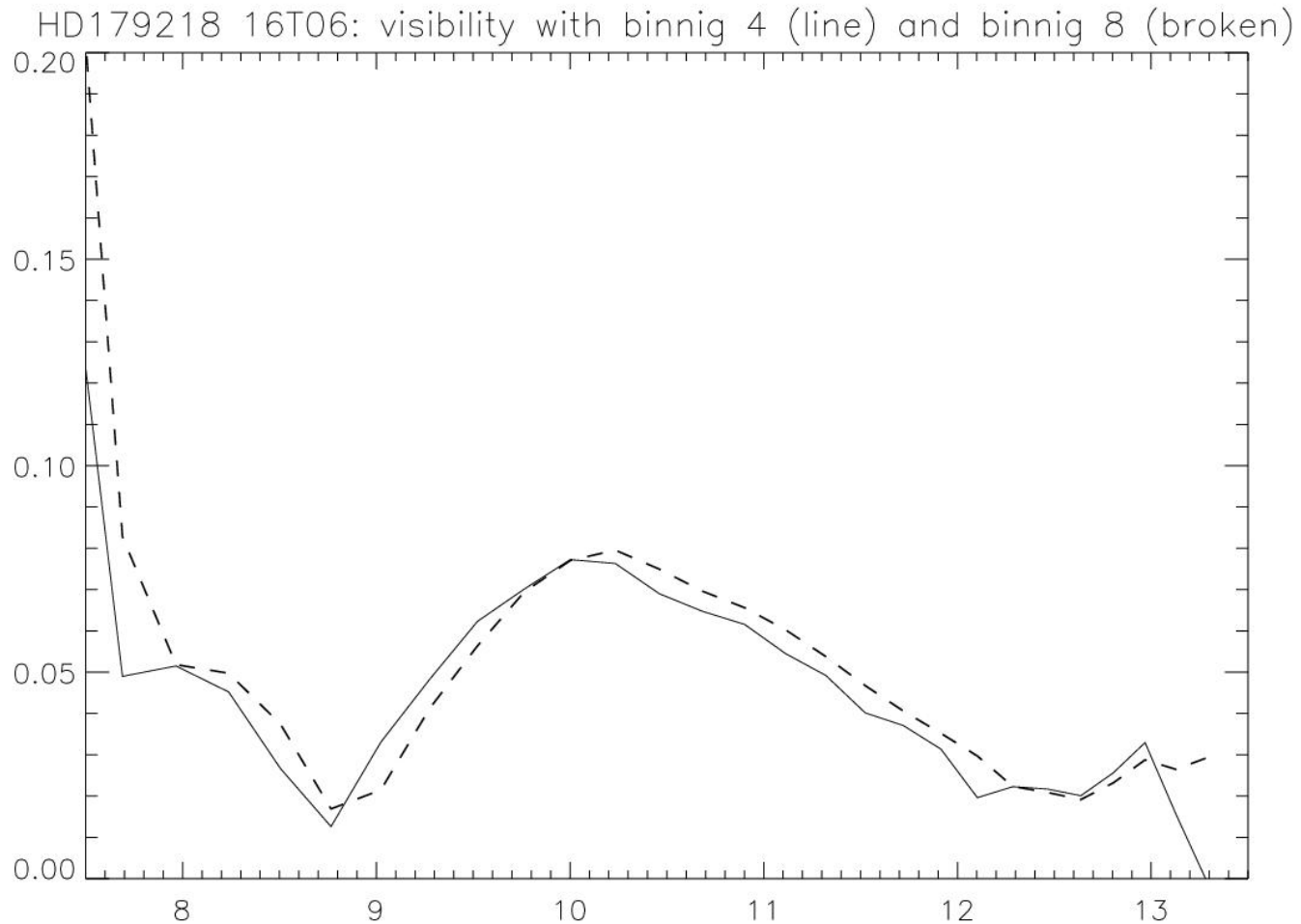
TF on MIDI calibrators (run june 2003)



■ 19psc ◆ 7cet ▲ 7psc △ alfaq1 ◆ etasgr ● gam2sgr ✕ hr6546 □ iotcet — kaplib ◇ nu.psc ■ tausgr ▲ v1068sco □ v337car ○ zetara

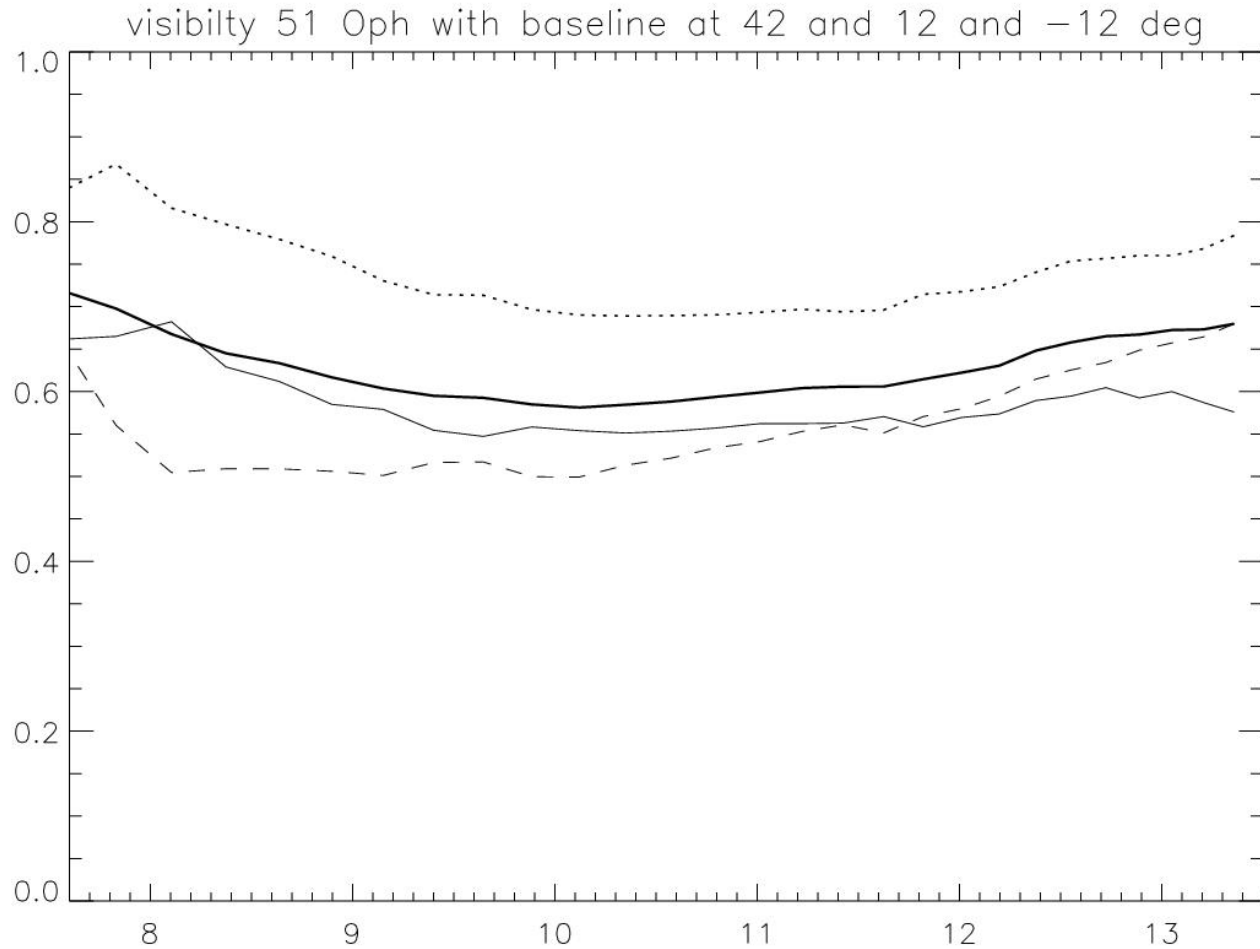
Preliminary result communicated by I. Percheron

# SD1 Results – HD 179218



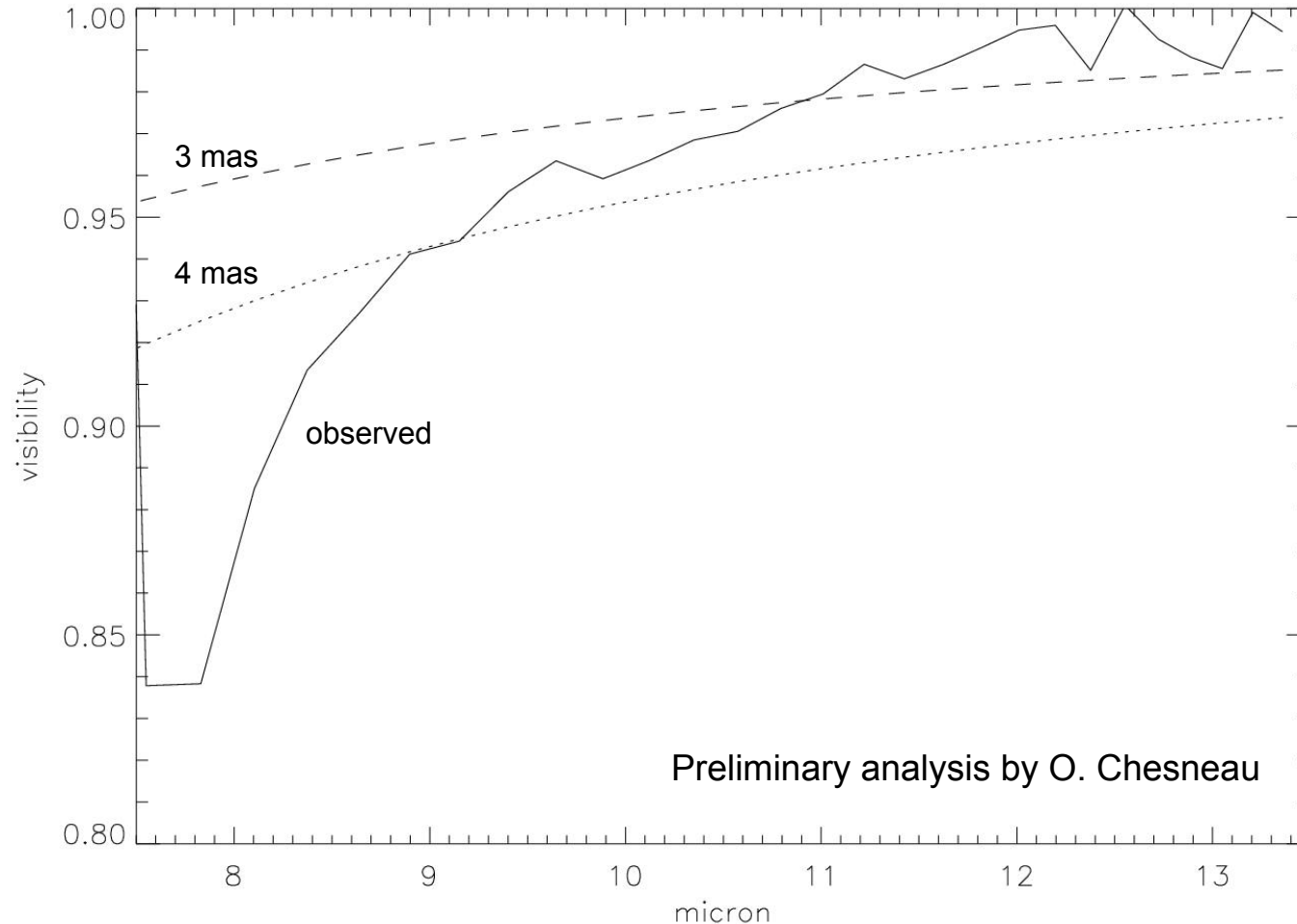
Preliminary result communicated by Ch. Leinert & R. Waters.

# SD1 Results – 51 Oph



Preliminary result communicated by Ch. Leinert & F. Malbet

# SD1 Results – Alf Ara



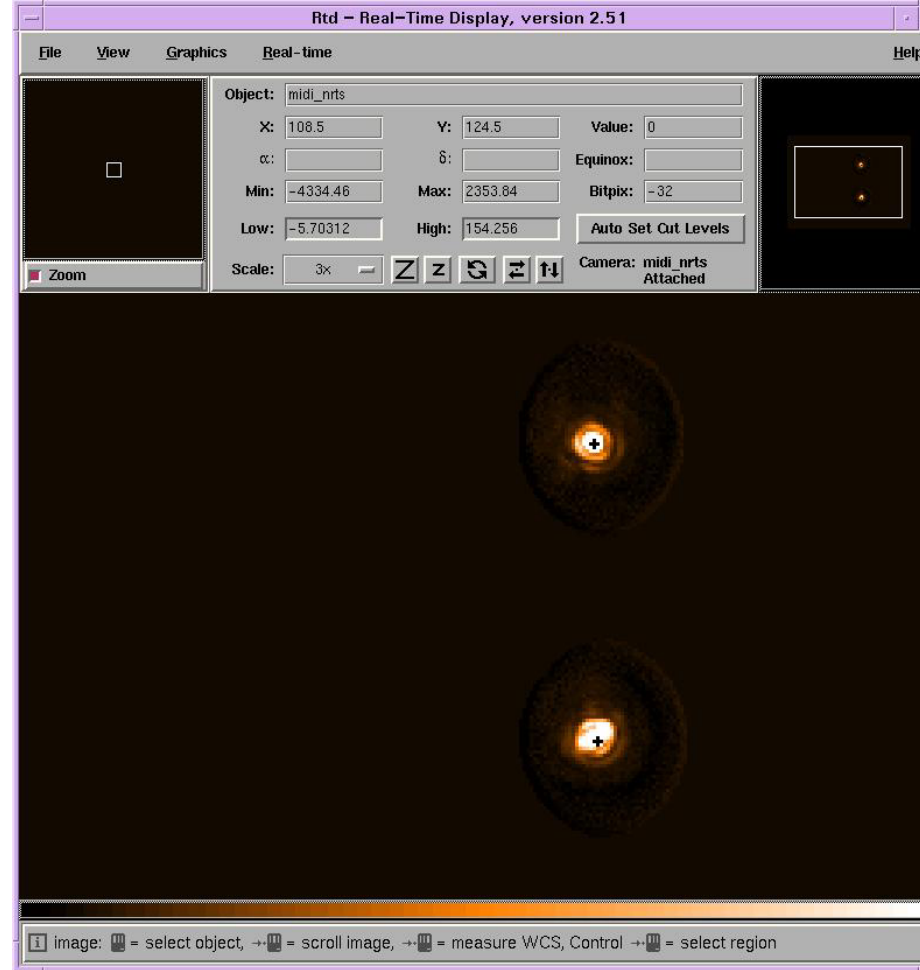
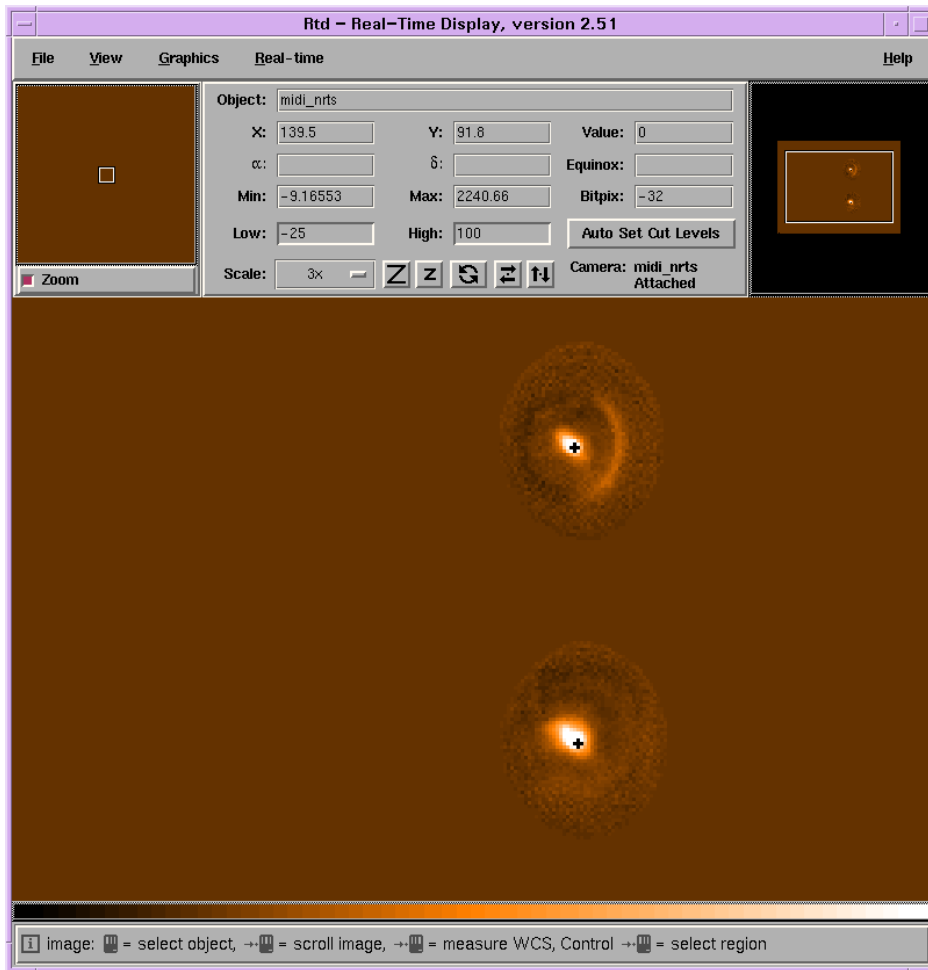
Size smaller than model predictions,  
valuable constraint on theory.

Night June 15-16, 102m  
baseline, good conditions

# SD1 Results – NGC 1068

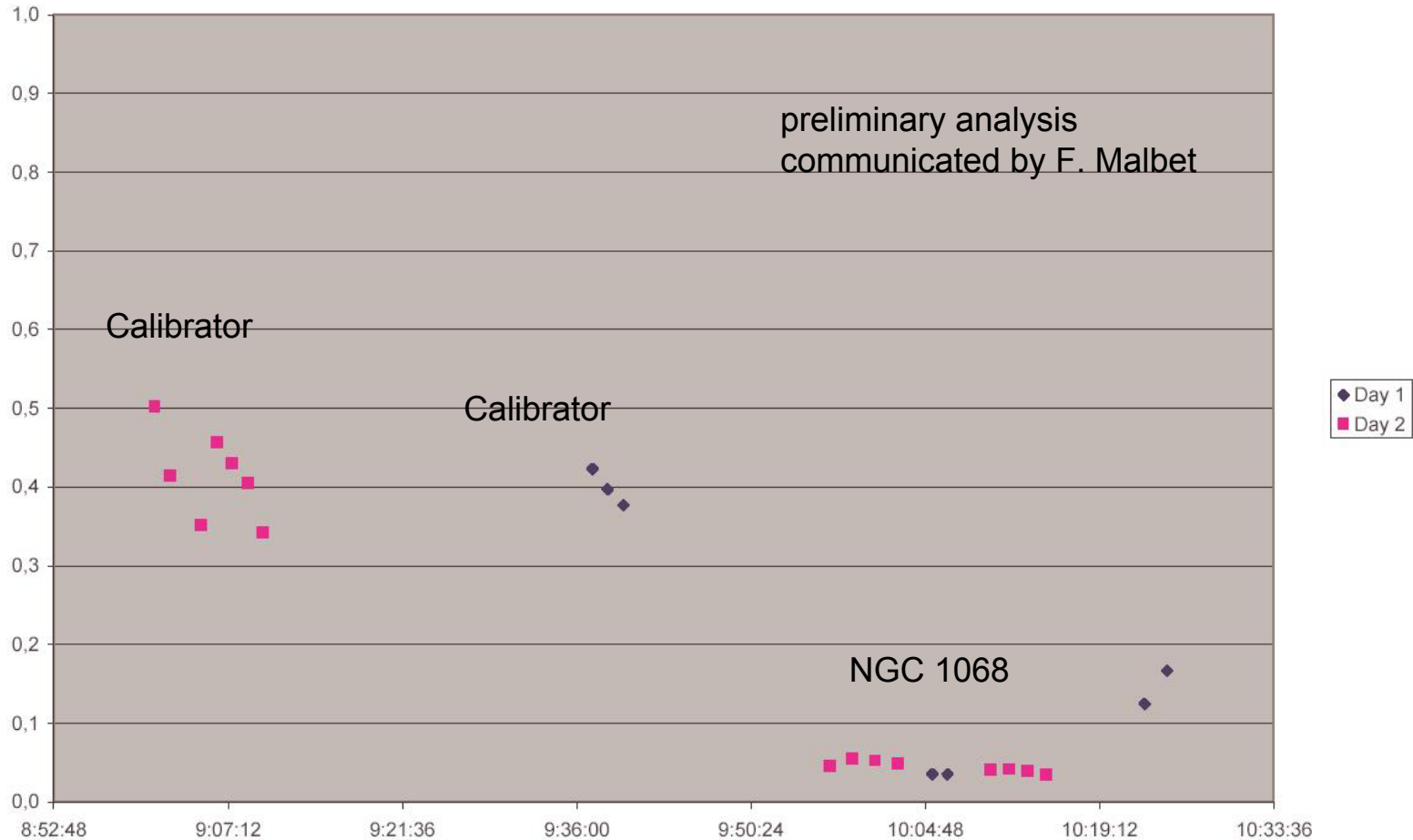
- First interferometric result on AGN
- ESO Press release prepared during the run
- Wide echo on the WEB, several contacts
- Plans for publication of the results
- Plans for further observations

# Centering NGC 1068



Relatively good image quality, in spite of absence of VCM

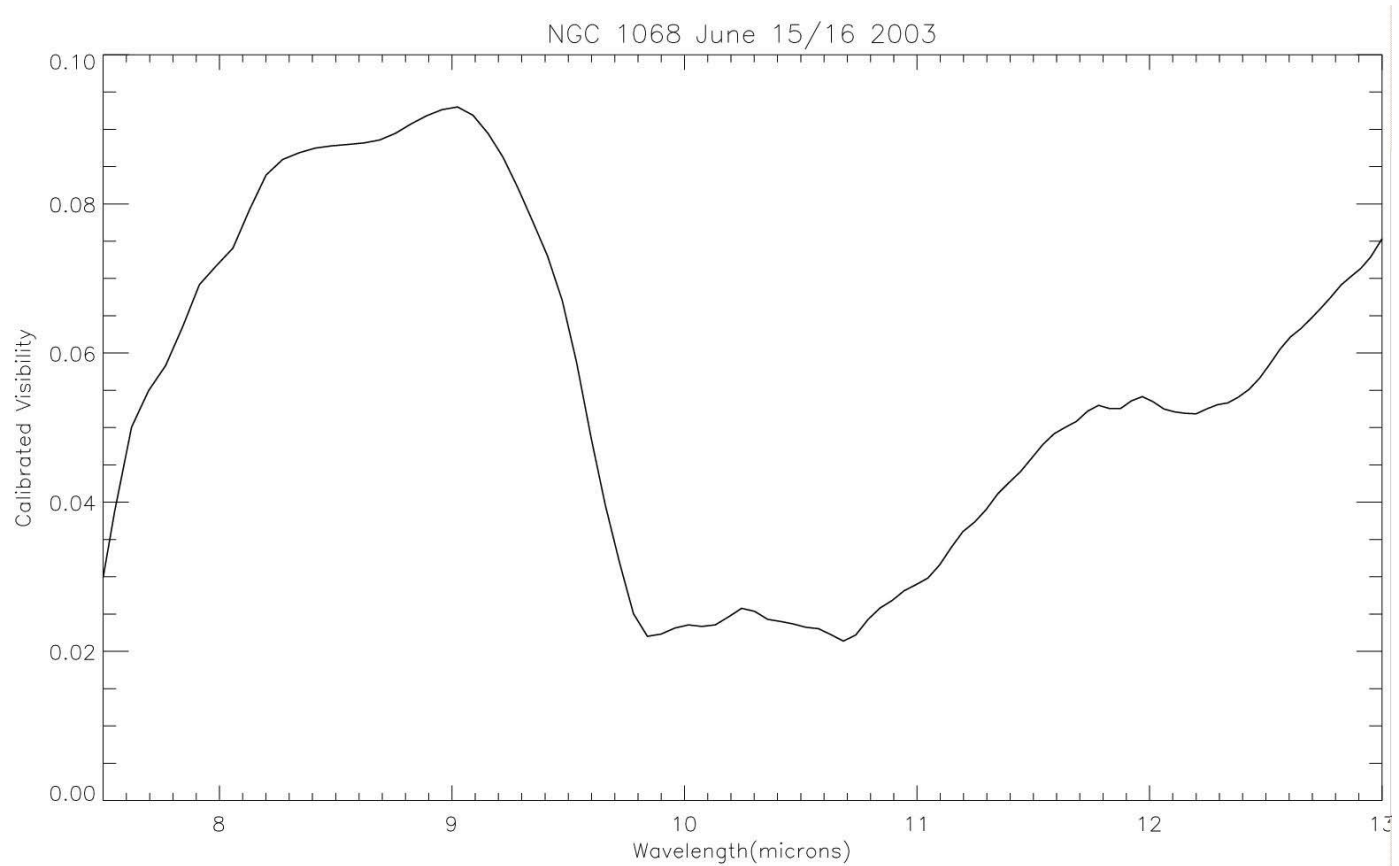
# Calibrating NGC 1068



Relatively good 1<sup>st</sup> night, less good 2<sup>nd</sup> night, no useful data 3<sup>rd</sup> night



# Unveiling NGC 1068



preliminary analysis  
communicated by W. Jaffe

# SD2 Requests (Mar03)

	SDT Coord	PI	Objects, Period	Vis Pts/obj
Debris Disks	Malbet	Di Folco	2, Oct-Nov	3+3
Betelgeuse	Richichi	Perrin	1, Dec	8
Asymm, dust in AGB	Preibisch	Ohnaka	2, Jan-Feb	3+3
Dusty Disks in post-AGB binaries	Waters	Waters	2, Jan, Mar	5+5
AGN (NGC1068)	Röttgering	Röttgering	1, Oct	10
massive disks in YSOs	Waters	Waters	1, Nov	5
R Mon	Herbst	Leinert	1, Dec	6
HAeBe stars	Waters	Waters	2, Feb-Mar	5+5
FU Ori	Malbet	Malbet	1, Nov	6
Total				51-67

- ~7 nights envelope. Request 4 nights in October 2003 (no FT, no AO), + 3 nights in Feb/Mar 2004 (FT, AO).
- VCM needed! Choice of telescopes for October, UT2-UT4 for Feb/Mar.
- Several AMBER proposals also received, will be considered for SD3.

4 nights November, UT2-UT3 (47m).

3 nights February. No FT, baseline UT2-UT3 (TBC).

More knowledge about MIDI modes, efficiency and accuracy.