AMBER Data at ESO Quality assessment and distribution (Isabelle Percheron, QCG)

Contents

- (AMBER) Data flow: from proposal back to the user,
- data quality assessment,
- Tools,
- Data Reduction workflow
- AMBER data quality control
- Contents of the data packages
- QC pages: calibration availability and info
- Known issues: P2VM, cutoff
- News for P87
- Future

AMBER data: User to User



Quality assessment (QC0) on Paranal

•All the sub-systems are working as requested,

Constraints within user specifications for the full sequence

•If CAL1-SCI-CAL2 sequence: CAL1 and CAL2 are both of the same quality \rightarrow TF (Vis) monitoring

•Calibrations followed the calibration plan (P2VM done within 6 hours in the same instrument setting)

GRADING of the OB sequence: ABCD

Quality assessment on Paranal



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Files observed

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Q Q Q Alder Collection (S and Collection (S	080.A- 0095(A)	CI 451894	HD73947	3Tstd_obs_lrow	2011-03-16 T00:1	3:19 7	3 AMBER.2011-03-16 T00:25	:16.558 fits	3TSTD_OBS075_0002 fits	c.	ALIB	OBJECT	INTERFEROM	0.0260	3Tstd_Low_JHK	PRISM	527.78	-1.00	NAR_SL	гк
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000 A 000 A <td< td=""><td> 080.A- 0095(A) </td><td>C 451921</td><td>rspup</td><td>3Tstd_obs_lrow</td><td>2011-03-16 T00:4</td><td>9:34 7</td><td>4 AMBER:2011-03-16 T00:55</td><td>:31.300 fits</td><td>3TSTD_0BS075_0008.fms</td><td>s</td><td>CIENCE</td><td>OBJECT</td><td>INTERFEROM</td><td>0.1000</td><td>3Tstd_Low_JHK</td><td>PRISM</td><td>527.78</td><td>-1.00</td><td>NAR_SL</td><td>гк</td></td<>	 080.A- 0095(A) 	C 451921	rspup	3Tstd_obs_lrow	2011-03-16 T00:4	9:34 7	4 AMBER:2011-03-16 T00:55	:31.300 fits	3TSTD_0BS075_0008.fms	s	CIENCE	OBJECT	INTERFEROM	0.1000	3Tstd_Low_JHK	PRISM	527.78	-1.00	NAR_SL	гк
⁰⁰⁰ A, ⁰⁰⁰ A, ¹⁰⁰ B, ¹⁰⁰ B,	 080.A- 0005(A) 	C 451921	rspup	3Tstd_obs_lrow	2011-03-16 T00:4	9:34 7	5 AMBER:2011-03-16 T00:57	:42.318 fits	3TSTD_OBS075_0009 fits	SI	CIENCE	OBJECT	INTERFEROM	0.1000	3 Tstd_Low_JHK	PRISM	527.78	-1.00	NAR_SL	гк
000 A A 51880 HD78004 3 Trad_skq 2011-03-16 T00.469.4 7 7 AMBER 2011-03-16 T01.02:14.666 fs 3 TSTD_SKY075_0002 fs SCIENCE SKY INTERFERON 0.000 3 Trad_lww_JHK PRISM 527.78 -1.00 NAR_SLT × 000 A A 451880 HD78004 3 Trad_skq 2011-03-16 T02.4637 2 2 AMBER 2011-03-16 T02.50.46 ADJUST_COLPOSOT5_0005 fs CALIB COLPOS INTERFERON 1.000 3 Trad_skq 217.196 NAR_SLT × 000 A A 51880 HD78004 3 Trad_skq 2011-03-16 T02.4637 2 3 AMBER 2011-03-16 T02.51.15.94 fm ADJUST_COLPOSOT5_0005 fs CALIB COLPOS INTERFERON 1.000 3 Trad_skq 217.196 NAR_SLT × 000 A A 451880 HD78004 3 Trad_skq 2011-03-16 T02.51.30 613 fm ADJUST_COLPOSOT5_0007 fms CALIB COLPOS INTERFERON 1.000 3 Trad_skq 217.196 NAR_SLT × 000 A A 451880 HD78004 3 Trad_skq 2011-03-16 T02.52.33 855 fm 3 TSTD_AC0075_0106 fms CALIB VAVE3TEL INTERFERON	 080.A- 0095(A) 	C 451921	rspup	3 Tstd_obs_lrow	2011-03-16 T00:4	9:34 7	6 AMBER.2011-03-16 T00:59	:59.454 fits	3TSTD_OBS075_0010 fits	SI	CIENCE	OBJECT	INTERFEROM	0.1000	3 Tstd_Low_JHK	PRISM	527.78	-1.00	NAR_SL	гк
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Quality assessment (QC1) in Garching

• All the calibration data are processed with the instrument pipeline and assessed using a scoring system, selected files are examined by the QC scientist to be certified, rejected, re-graded (through USD/Paranal/User feedback)

• The science data are then processed using the best available calibration and pipeline parameters

 If anything is wrong with the data, there is feedback to Paranal/User (P2VM, cutoff)
 Failure of one subsystem
 data quality through the sequence

Automatic scoring system

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	CAL report NR refs													HELP
s	AB NAME	COMPL.	AB LOG	RECIPE \$	RAW_TYPE \$	SETUP	\$	AB STATUS F	P LOG	T_EXEC¢	QC REPORT	SCOF	RE	CERTIF \$
	AMBER.2011-03-14T23:18:53.427 tpl.ab	compl.	ОК	none	CAL COLPOS	DONE		OK F	P LOG	0.0	check raw!			
	AMBER.2011-03-14T23:19:30.356 tpl.ab	compl.	OK	amber p2vm	- 3P2V	PRISM Low JHK		OK F	P LOG	0.6+0.8	DONE	✓ _{нс}	(0/4)	AUTO
	AMBER.2011-03-14T23:23:56.368_tpl.ab	compl.	<u>0K</u>	none	CAL_SE	DONE		OK E	<u>LOG</u>	0.0	check raw!			
	AMBER.2011-03-14T23:45:54.331_tpl.ab	compl.	<u>0K</u>	none	CAL_COLPOS	DONE		OK <u>F</u>	<u>LOG</u>	0.0	check raw!			
	AMBER.2011-03-14T23:55:23.098_tpl.ab	compl.	<u>0K</u>	amber_p2vm	3P2V	PRISM_Low_JHK		ок <u>в</u>	<u>_LOG</u>	0.8+0.6	DONE	О нс	<u>(1/4)</u>	OK one file has 99 zeroes frames, data taken unsing this P2VM are classified (
	AMBER.2011-03-15T00:01:39.038_tpl.ab	compl.	<u>0K</u>	none	CAL_SE	DONE		OK <u>F</u>	<u>LOG</u>	0.0	check raw!			
	AMBER.2011-03-15T00:22:29.165_tpl.ab	compl.	<u>0K</u>	amber_SciCal	CALIB_FRINGE	PRISM_Low_JHK_0.100000)0	ok <u>f</u>	<u>LOG</u>	4.9+78.8	<u>ac</u>	×	<u>(2/11)</u>	OK classified C because of SCIENCE
	AMBER.2011-03-15T01:10:26.100_tpl.ab	compl.	<u>0K</u>	amber_SciCal	CALIB_FRINGE	PRISM_Low_JHK_0.100000)0	ок <u>в</u>	LOG	5.6+78.5	<u>ac</u>	0	<u>(1/11)</u>	OK classified C, out of constraints
	AMBER.2011-03-15T01:36:55.543 tpl.ab	compl.	<u>ok</u>	none	CAL_COLPOS	DONE		OK F	P LOG	0.0	check raw!			
	AMBER.2011-03-15T01:38:40.687_tpl.ab	compl.	<u>0K</u>	amber_p2vm	3P2V	GHR_High_K_1_2.172		OK E	LOG	1.3+0.8	DONE	✔нс	(0/4)	AUTO
	AMBER.2011-03-15T01:45:13.715_tpl.ab	compl.	<u>ok</u>	amber_SciCal	CALIB_FRINGE	GHR_High_K_1_2.172_6.00	00000	ok E	<u>, LOG</u> I	1.6+10.6	<u>ac</u>	×	<u>(5/11)</u>	OK classified C, out of constraints
	AMBER.2011-03-15T02:30:15.246_tpl.ab	compl.	<u>0K</u>	amber_SciCal	CALIB_FRINGE	GHR_High_K_1_2.172_6.00	00000	ок <u>в</u>	<u>LOG</u> I	0.9+8.2	<u>ac</u>	×	<u>(5/11)</u>	OK classified C, out of constraints
	AMBER.2011-03-15T02:43:36.018_tpl.ab	compl.	<u>0K</u>	amber_SciCal	CALIB_FRINGE	GHR_High_K_1_2.172_6.00	00000	ок <u>ғ</u>	<u>LOG</u> I	0.8+6.6	<u>ac</u>	×	<u>(5/11)</u>	OK classified C, out of constraints
	AMBER.2011-03-15T04:32:44.811_tpl.ab	compl.	<u>0K</u>	none	CAL_COLPOS	DONE		OK E	<u>LOG</u>	0.0	check raw!			
	AMBER.2011-03-15T04:35:35.988_tpl.ab	compl.	<u>0K</u>	amber_p2vm	3P2V	GMR_Medium_K_1_2.1		OK <u>F</u>	<u>LOG</u>	0.9+0.6	DONE	✔нс	(0/4)	AUTO
	AMBER.2011-03-15T04:49:31.149_tpl.ab	compl.	<u>0K</u>	amber_SciCal	CALIB_FRINGE	GMR_Medium_K_1_2.1_0.2	2000000	ok <u>e</u>	<u>P_LOG</u> I	2.1+2.9	<u>QC</u>	×	<u>(6/11)</u>	OK very noisy Vis, FNT could not lock, bad conditions, VM
	AMBER.2011-03-15T05:21:14.515_tpl ab	compl.	<u>0K</u>	amber_SciCal	CALIB_FRINGE	GMR_Medium_K_1_2.1_0.2	2000000	ок <u>г</u>	<u>P_LOG</u> I	2.0+2.6	<u>QC</u>	×	<u>(5/11)</u>	OK very noisy Vis, FNT could not lock, had conditions, VM
	AMBER.2011-03-15T05:34:25.654_tpl.ab	compl.	<u>OK</u>	amber_SciCal	CALIB_FRINGE	GMR_Medium_K_1_2.1_0.2	2000000	OK E	<u>LOG</u>	3.1+12.5	<u>QC</u>	×	(6/11)	OK Low Vis, TF, VM
	AMBER.2011-03-15T05:56:22.431_tpl.ab	compl.	<u>0K</u>	amber_SciCal	CALIB_FRINGE	GMR_Medium_K_1_2.1_0.2	2000000	OK <u>F</u>	<u>LOG</u> I	2.0+6.7	<u>QC</u>	×	(4/11)	OK Low Vis, TF,
	AMBER.2011-03-15T08:39:43.466 tpl.ab	compl.	ОK	none	CALIB DARK	0.0290000		OK F	P LOG	0.0	check raw!			
	AMBER.2011-03-15T08:42:19.903_tpl.ab	compl.	OK	none	CALIB_DARK	0.0290000		OK E	LOG	0.0	check raw!			
	AMBER.2011-03-15T08:45:20.030_tpl.ab	compl.	<u>OK</u>	none	CALIB_DARK	0.1860000		OK E	<u>LOG</u>	0.0	check raw!			
	AMBER.2011-03-15T08:53:40.047_tpl.ab	compl.	<u>0K</u>	none	CALIB_DARK	0.1860000		OK E	P_LOG	0.0	check rawl			
	AMBER.2011-03-15T09:02:37.624_tpl.ab	compl.	<u>OK</u>	none	CALIB_DARK	0.1870000		OK E	LOG	0.0	check raw!			
	AMBER.2011-03-15T09:10:58.628_tpl.ab	compl.	<u>OK</u>	none	CALIB_DARK	0.18/0000		OK E	LOG	0.0	check raw!			
	AMPER.2011-03-15109:18:59.603_tpl.ab	compl.		none	CALIB_DARK	0.1000000				0.0	check rawl			
	AMRED 2011 03 15T09:22:40.955_tpl.ap	compl.	OK	none	CALIB DARK	6.000000				0.0	check rawl			
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		oompi.		1.0110	UNLID_DARK	0.000000				0.0	CHOCK TOW!			

Some numbers

AMBER: ABs (FULL range, 2615 days)





Tools available

- Observatory/QC tools:
 - AB builder to find the best files (calibration) to be associated for data processing:
 - Time, Instrument settings, airmass constraints
- Instrument pipeline (running amdlib 2.2)
 > public (http://www.eso.org/sci/software/pipelines/)
- CalVin database (from P87 in collaboration with JMMC)
- QC scripts to assess quality of the data
 - scoring system (based on present Health of the instrument or fixed threshold)
 - Monitoring of the TF
 - Reports on the individual/merged files

Data reduction workflow

- Data are transferred to Garching via the Fast Data Transfer System
 - > Automatic, real time processing for the calibration data
- Processing of individual files
 - Filtering applied (FNT and instrument setting dependent)
 - TF calculated when calibrator (CalVin), Calibrated Visibility when SCIENCE and TF available
- Merging of the individual files
 - Filtering applied
 - TF calculated when calibrator (CalVin), Calibrated Visibility when SCIENCE and TF available

Data reduction workflow

- AMBER pipeline processing based on amdlib 2.2:
 - using raw, most accurate available calibration data and databases (CalVin) to produce merged, filtered products, Instrumental transfer function, calibration files and calibrated Visibilities.
- Additional plots and comments
- All of the above (and more) are available to the PIs (DVD or user portal).

VLTI Quality Control: AMBER

AMBER.2011-02-18T02:42:08.116.-CALIB_FILTERED_MERGED_OB:CAL_SA0237916-K-MODE:Med Bas:H0-11-E0_TARG:SA0237918-plotted_0177-snr<5:0000-snr>=5:0177 snr b1:4.88658E+01-b2:4.80639E+01-b3:3.79670E+01-snr>5_b1:0059-b2:0059-b3:0059 select:0059(0023%)-FringeSNRpistonMerged-X1=1.00000E-04-X2=1.00000E-04-X3=1.0000



VLTI Quality Control: AMBER

AMBER.2011-02-18T02:42:08.116.-CALIB_FILTERED_MERGED_0B:CAL_SA0237916-K-MODE:Med Bas:H0-11-E0_TARC:SA0237916-plotted_0177-snr<5:0000-snr>=5:0177 snr b1:4.88658E+01-b2:4.80639E+01-b3:3.79670E+01-snr>5_b1:0059-b2:0059-b3:0059 select:0059(0023%)-FringeSNRpistonMerged-X1=1.00000E-04-X2=1.00000E-04-X3=1.0000

uncalVis K 2010-12-08.fits (UNCALV2CENBAS2 1-1 select:0059(0023%)-FringeSNRpistonMe



VLTI /AMBER QC (and other) projects

• Calibrations:

- calibrator project,
- updated calibrator database for the CalVin tool (JMMC),
- bad calibrators.
- In collaboration with Sciops and USD:
 - monitoring and stability of the Instrumental Transfer Function
 - quality of the observation, night stability of the TF for the user.
- DRS:
 - pipeline development: merged files, filtering based on instrumental setup, instrumental transfer function, analysis of the FNT data, update with newest libraries,
 - Reflex workflow,
 - > AMBER workshops.

VLTI Quality Control: AMBER



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VLTI Quality Control: AMBER



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Contents of the data packages

- raw data: science and night calibrations (calibrator and P2VM in the same instrument setting), even classified C data
- data products:
 - Calibration files: BPM, FFM, P2VM (raw and products), Cold dark (raw files)
 - Calibrator(s): individual processed, filtered files, merged files (before and after filtering), calibrator data base, TF (individual and merged) if available
 - Science: individual processed, filtered files, merged files (before and after filtering), associated TF
- Plots, Night Report on the OBs (classification) and comments (for ex. If NULLs in the P2VM)

Since mid 2009, VM and SM packages are available through the ESO user portal

Availability of the calibration files and more information on AMBER

- Quality control WebPages:
 - Calibration files: BPM, FFM (all the past ones are also available)
 - Information about the packages
 - Some monitoring plots on Calibrator Visibilities

- Health Check pages:
 - Internal Visibility
 - Cutoff
 - ➢Night Vis
- Calchecker (internal)

Known issues

➢ P2VM: zeroes

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mjd-obs

Known issues



Cutoff of the K spectrum in LR

AMBER: Cutoff wavelength for K in LR (last 60 days, close-up) QC data range: 2011-01-19 ... 2011-03-17*



New for P87 and after

RMNREC data available: ➤ FINITO (jitter estimation -→ Vis post processing)

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9	FN	NTI	Binary	11 cols X 5	1250 rows	Header	Hist	Plot		Select	11	4687	7.835379136409E-05	1	1	7	-3.762939265410E+00	3.434496208636E-03	4
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New for P87 and after

RMNREC data available:
 ➤ FINITO (jitter estimation -→ Vis post processing)

- Transfer Function monitoring (same for Paranal and Garching)
- Self coherencing (FNT sensitivity, AMBER fringe track) → shared risk (offered for P89)

on going-future projects

(in collaboration with ESO groups and community)

- Follow the development of DRS in the community: reduction algorithms, AMBER workshops, science and data reduction meetings:
 - Implementation in the instrument pipelines to provide more accurate, "up to date" data products
- External experts to provide better services
 - JMMC (list of calibrators, FNT RMNREC, amdlib3.0).
- Provide the community with specific tools : instrument pipeline implemented with the latest available software, CalVin, VisCal, reflex workflow.

Reflex workflow (Basic)



on going-future projects (Con't)

(in collaboration with ESO groups and community)

 Provide the community with information to help with the observations, calibrator project, observed calibrators, bad calibrators, monitoring of the instrumental Transfer Function: short and long term.

Archive of data on already observed objects

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on going-future projects

(in collaboration with ESO groups and community)

- Follow the development of DRS in the community: reduction algorithms: AMBER workshops, science and data reduction meetings:
 - Implementation in the instrument pipelines to provide more accurate, "up to date" products
- Request SER CONNECTOR STYCes.
 Provide the community with specific tools : instrument
- Provide the community with specific tools : instrument pipeline implemented with the latest available software, CalVin, VisCal, reflex workflow.
- Provide the community with information to help with the observations, calibrator project, observed calibrators, bad calibrators, monitoring of the instrumental Transfer Function: short and long term.