What's inside the delivery package?

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This presentation

- provides an outline about contents of the data package delivered to PI and available via the archive
  - They change from the previous cycles (Cycle 0-4) ones
- provides briefs about QA2 report in SnooPI (new in Cycle 5)
- focuses on Pipeline (PL) processed Interferometer data product

Acknowledgement

- This presentation makes use of a Cycle 5 delivery package which is by courtesy of Yamashita-san (Ehime Univ.). We sincerely thank his kind understanding.

Package: the archive

Package: Inside (1)

```
2017.1.01158.S/
└── science_goal.uid___A001_X1284_X12de
    └── group.uid___A001_X1284_X12df
        └── member.uid___A001_X1284_X12e0
            ├── calibration
            ├── log
            ├── product
            ├── qa
            └── script
```

- **`calibration`**: calibration tables
- **`log`**: data reduction log files
- **`product`**: image products (FITS files)
- **`qa`**: PL weblog
- **`script`**: script files to restore PL calibration

Package: Inside (2-1)

```
member.uid___A001_X1284_X12e0/
├── member.uid___A001_X1284_X12e0.README.txt
├── calibration
│   ├── member.uid___A001_X1284_X12e0.hifa_calimage.auxproducts.tgz
│   ├── member.uid___A001_X1284_X12e0.session_1.auxcaltables.tgz
│   ├── member.uid___A001_X1284_X12e0.session_1.caltables.tgz
│   ├── uid___A002_Xc55c89_X244f.ms.calapply.txt
│   ├── uid___A002_Xc55c89_X244f.ms.flagversions.tgz
│   └── uid___A002_Xc55c89_X244f_target.ms.auxcalapply.txt
├── log
│   └── member.u
├── qa
│   └── member.u
├── script
│   ├── member.uid___A001_X1284_X12e0.calimage.pipeline_manifest.xml
│   ├── member.uid___A001_X1284_X12e0.calimage.product_rename.txt
│   ├── member.uid___A001_X1284_X12e0.hifa_calimage.casa_piperestorescript.py
│   ├── member.uid___A001_X1284_X12e0.hifa_calimage.casa_pipescript.py
│   ├── member.uid___A001_X1284_X12e0.hifa_calimage.pprequest.xml
│   └── member.uid___A001_X1284_X12e0.scriptForPI.py
```

Calibration tables and auxiliary files (for restoring PL calibration)

Package: Inside (2-2)

```
member.uid___A001_X1284_X12e0/
├── member.uid___A001_X1284_X12e0.README.txt
├── calibration
│   ├── member.uid___A001_X1284_X12e0.hifa_calimage.auxproducts.tgz
│   ├── member.uid___A001_X1284_X12e0.session_1.auxcaltables.tgz
│   ├── member.uid___A001_X1284_X12e0.session_1.caltables.tgz
│   ├── uid___A002_Xc55c89_X244f.ms.calapply.txt
│   ├── uid___A002_Xc55c89_X244f.ms.flagversions.tgz
│   └── uid___A002_Xc55c89_X244f_target.ms.auxcalapply.txt
├── log
│   └── member.uid___A001_X1284_X12e0.hifa_calimage.casa_commands.log
├── qa
│   └── member.uid___A001_X1284_X12e0.hifa_calimage.weblog.tgz
└── script
    ├── member.uid___A001_X1284_X12e0.calimage.pipeline_manifest.xml
    ├── member.uid___A001_X1284_X12e0.calimage.product_rename.txt
    ├── member.uid___A001_X1284_X12e0.hifa_calimage.casa_piperestorescript.py
    ├── member.uid___A001_X1284_X12e0.hifa_calimage.casa_pipescript.py
    ├── member.uid___A001_X1284_X12e0.hifa_calimage.pprequest.xml
    └── member.uid___A001_X1284_X12e0.scriptForPI.py
```

CASA commands run by PL

Weblog by PL

Package: weblog

Home | By Topic | By Task | 2017.1.01158.S

Observation Overview

Project	uid://A001/X122c/X22f
Principal Investigator	takuji
OUS Status Entity id	uid://A001/X1284/X12e0
Observation Start	2017-10-05 05:26:32 UTC
Observation End	2017-10-05 05:50:02 UTC

Pipeline Summary

Pipeline Version	40896 (Pipeline-CASA51-P2-B) (documentation)
CASA Version	5.1.1-5 r40000
Pipeline Start	2017-11-20 08:07:42 UTC
Execution Duration	0:45:59

Observation Summary

Measurement Set	Receivers	Num Antennas	Time (UTC)			Baseline Length			Size
			Start	End	On Source	Min	Max	RMS	
Observing Unit Set Status: uid://A001/X1284/X12e0 **Scheduling Block ID:** uid://A001/X1284/X1223									
Session: session_1									
uid___A002_Xc55c89_X244f.ms	ALMA Band 6	11	2017-10-05 05:26:32	2017-10-05 05:50:01	0:05:02	8.9 m	48.9 m	27.9 m	732.5 MB
uid___A002_Xc55c89_X244f_target.ms	ALMA Band 6	11	2017-10-05 05:44:43	2017-10-05 05:44:43	0:05:02	8.9 m	48.9 m	27.9 m	141.7 MB

Package: Inside (2-3)

```
member.uid___A001_X1284_X12e0/
├── member.uid___A001_X1284_X12e0.README.txt
├── calibration
│   ├── member.uid___A001_X1284_X12e0.hifa_calimage.auxproducts.tgz
│   ├── member.uid___A001_X1284_X12e0.session_1.auxcaltables.tgz
│   ├── member.uid___A001_X1284_X12e0.session_1.caltables.tgz
│   ├── uid___A002_Xc55c89_X244f.ms.calapply.txt
│   ├── uid___A002_Xc55c89_X244f.ms.flagversions.tgz
│   └── uid___A002_Xc55c89_X244f_target.ms.auxcalapply.txt
├── log
│   └── member.uid___A001_X1284_X12e0.hifa_calimage.casa_commands.log
│   └── member.uid___A001_X1284_X12e0.hifa_calimage.weblog.tgz
├── script
│   ├── member.uid___A001_X1284_X12e0.calimage.pipeline_manifest.xml
│   ├── member.uid___A001_X1284_X12e0.calimage.product_rename.txt
│   ├── member.uid___A001_X1284_X12e0.hifa_calimage.casa_piperestorescript.py
│   ├── member.uid___A001_X1284_X12e0.hifa_calimage.casa_pipescript.py
│   ├── member.uid___A001_X1284_X12e0.hifa_calimage.pprequest.xml
│   └── member.uid___A001_X1284_X12e0.scriptForPI.py
```

CASA scripts etc. for restoring PL calibration

Package: scriptForPI.py

The script for restoring PL calibration

```
# ALMA Data Reduction Script
# $Id: scriptForPI.py,v 1.23 2017/10/17 15:15:15 dpetry Exp $

# Calibration application

import os
import sys
import glob
from xml.etree import cElementTree as ET

applyonly = True

os.environ["LANG"] = "C"

print '*** ALMA scriptForPI ***'
casalog.origin('casa')
casalog.post('*** ALMA scriptForPI ***', 'INFO', 'scriptForPI')
casalog.post('$Id: scriptForPI.py,v 1.23 2017/10/17 15:15:15 dpetry Exp $', 'INFO', 'scriptForPI')

savingslevel=0
if globals().has_key("SPACESAVING"):
    print 'SPACESAVING =', SPACESAVING
    if (type(SPACESAVING)!=int or SPACESAVING<-1):
        sys.exit('ERROR: SPACESAVING value \"'+str(SPACESAVING)+'\" not permitted, must be int>=-1.\n'
                 + 'Valid values: 0 = no saving,\n'
                 + '              1 = delete *.ms.split,\n'
                 + '              2 = delete *.ms and *.ms.split,\n'
                 + '            >=3 = delete *.ms, *.ms.split, and if possible *.ms.split.cal'
                 + '             -1 = do not check disk space')

    savingslevel = SPACESAVING
```

Package: Inside (3-1)

science target

continuum (all the SPWs)

line (cube)

continuum (per SPW)

line (cube, user request BW)

```
product
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16_18_20_22.cont.I.mask.fits
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16_18_20_22.cont.I.pbcor.fits
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16_18_20_22.cont.I.pb.fits.gz
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16.cube.I.mask.fits
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16.cube.I.pbcor.fits
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16.cube.I.pb.fits.gz
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16.mfs.I.mask.fits
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16.mfs.I.pbcor.fits
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16.mfs.I.pb.fits.gz
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16.repBW.I.mask.fits
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16.repBW.I.pbcor.fits
├── member.uid___A001_X1284_X12e0._123765290183229451 7__sci.spw16.repBW.I.pb.fits.gz
├── ... (science target cubes and continuum image of other SPWs)
├── member.uid___A001_X1284_X12e0.J0006-0623_bp.spw16.mfs.I.mask.fits
├── member.uid___A001_X1284_X12e0.J0006-0623_bp.spw16.mfs.I.pbcor.fits
├── member.uid___A001_X1284_X12e0.J0006-0623_bp.spw16.mfs.I.pb.fits.gz
├── ... (J0006-0623 continuum images of other SPWs)
├── member.uid___A001_X1284_X12e0.J0141-0928_ph.spw16.mfs.I.mask.fits
├── member.uid___A001_X1284_X12e0.J0141-0928_ph.spw16.mfs.I.pbcor.fits
├── member.uid___A001_X1284_X12e0.J0141-0928_ph.spw16.mfs.I.pb.fits.gz
├── ... (J0141-0928 continuum images of other SPWs)
```

Package: Inside (3-2)

science target

```
├── product
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16_18_20_22.cont.I.mask.fits
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16_18_20_22.cont.I.pbcor.fits
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16_18_20_22.cont.I.pb.fits.gz
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16.cube.I.mask.fits
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16.cube.I.pbcor.fits
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16.cube.I.pb.fits.gz
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16.mfs.I.mask.fits
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16.mfs.I.pbcor.fits
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16.mfs.I.pb.fits.gz
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16.repBW.I.mask.fits
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16.repBW.I.pbcor.fits
│   ├── member.uid__A001_X1284_X12e0._1237652901832294517__sci.spw16.repBW.I.pb.fits.gz
│   ├── ... (science target cubes and continuum image of other SPWs)
│   ├── member.uid__A001_X1284_X12e0.J0006-0623_bp.spw16.mfs.I.mask.fits
│   ├── member.uid__A001_X1284_X12e0.J0006-0623_bp.spw16.mfs.I.pbcor.fits
│   ├── member.uid__A001_X1284_X12e0.J0006-0623_bp.spw16.mfs.I.pb.fits.gz
│   ├── ... (J0006-0623 continuum images of other SPWs)
│   ├── member.uid__A001_X1284_X12e0.J0141-0928_ph.spw16.mfs.I.mask.fits
│   ├── member.uid__A001_X1284_X12e0.J0141-0928_ph.spw16.mfs.I.pbcor.fits
│   ├── member.uid__A001_X1284_X12e0.J0141-0928_ph.spw16.mfs.I.pb.fits.gz
│   ├── ... (J0141-0928 continuum images of other SPWs)
```

continuum (all the SPWs)

line (cube)

continuum (per SPW)

line (cube, user request BW)

Bandpass cal. (continuum)

Phase cal. (continuum)

Weblog: calibrator images

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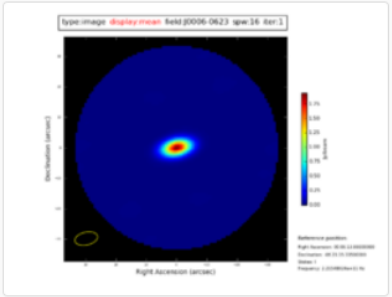
16. hifa_timegaincal
17. hif_applycal
18. hifa_imageprecheck
19. hif_makeimlist
20. hif_makeimages
21. hif_checkproductsize
22. hifa_exportdata
23. hif_mstransform
24. hifa_flagtargets
25. hif_makeimlist
26. hif_findcont
27. hif_uvcontfit
28. hif_uvcontsub
29. hif_makeimages
30. hif_makeimlist
31. hif_makeimages
32. hif_makeimlist
33. hif_makeimages
34. hif_makeimlist
35. hif_makeimages

20. Tclean/MakeImages

Make calibrator images

BACK

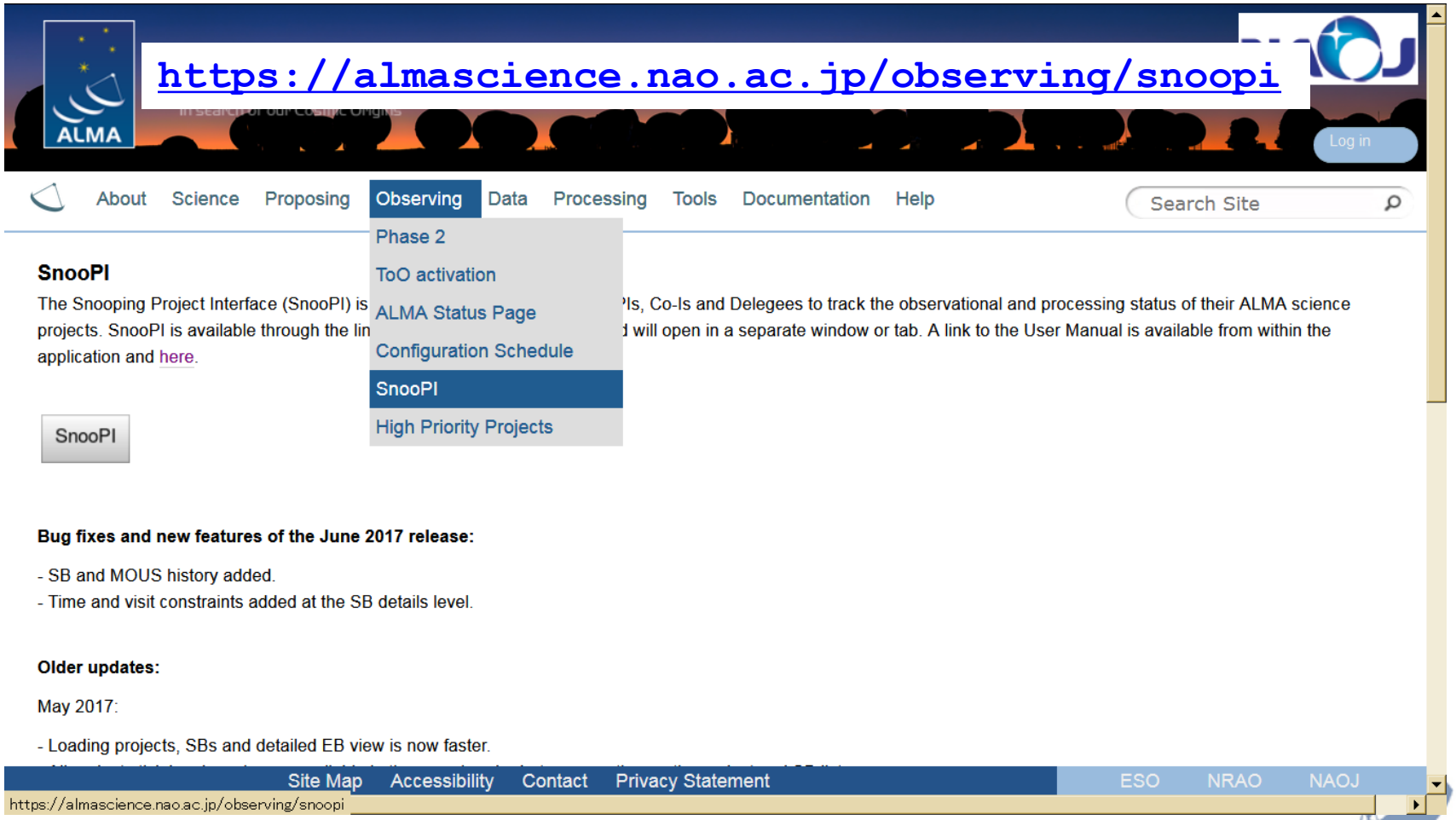
Image Details

Field	Spw	Pol	Image details		Image result
J0006-0623 (BANDPASS)	16	I	centre frequency of image	221.5480GHz (LSRK)	 View other QA images...
			beam	7.69 x 4.22 arcsec	
			beam p.a.	-77.6deg	
			final theoretical sensitivity	0.00051 Jy/beam	
			cleaning threshold	0.019 Jy/beam Dirty DR: 3.8e+03 DR correction: 19	
			clean residual peak / scaled MAD	12.94	
			non-pbcor image RMS	0.0020 Jy/beam	
			pbcor image max / min	1.94 / -0.00934 Jy/beam	

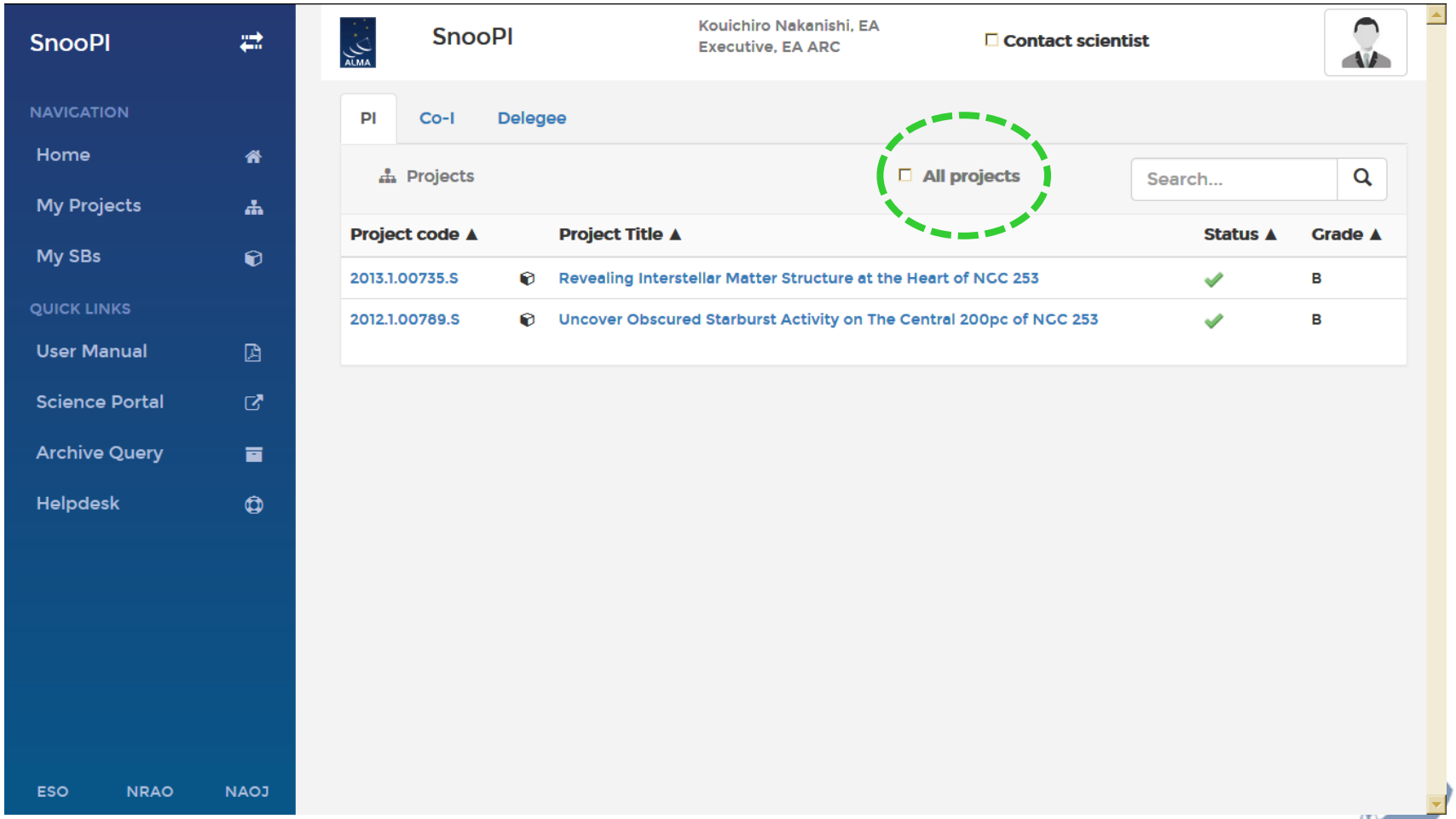
QA2 report

- provides summary of the data (beam size, noise level) and comments by data reducer
  - QA2 report replaces Cycle 0-4 README
- at the moment (Dec. 2017), one can access QA2 report solely via SnooPI
  - QA2 report will be available as a part of data package via the archive in the near future

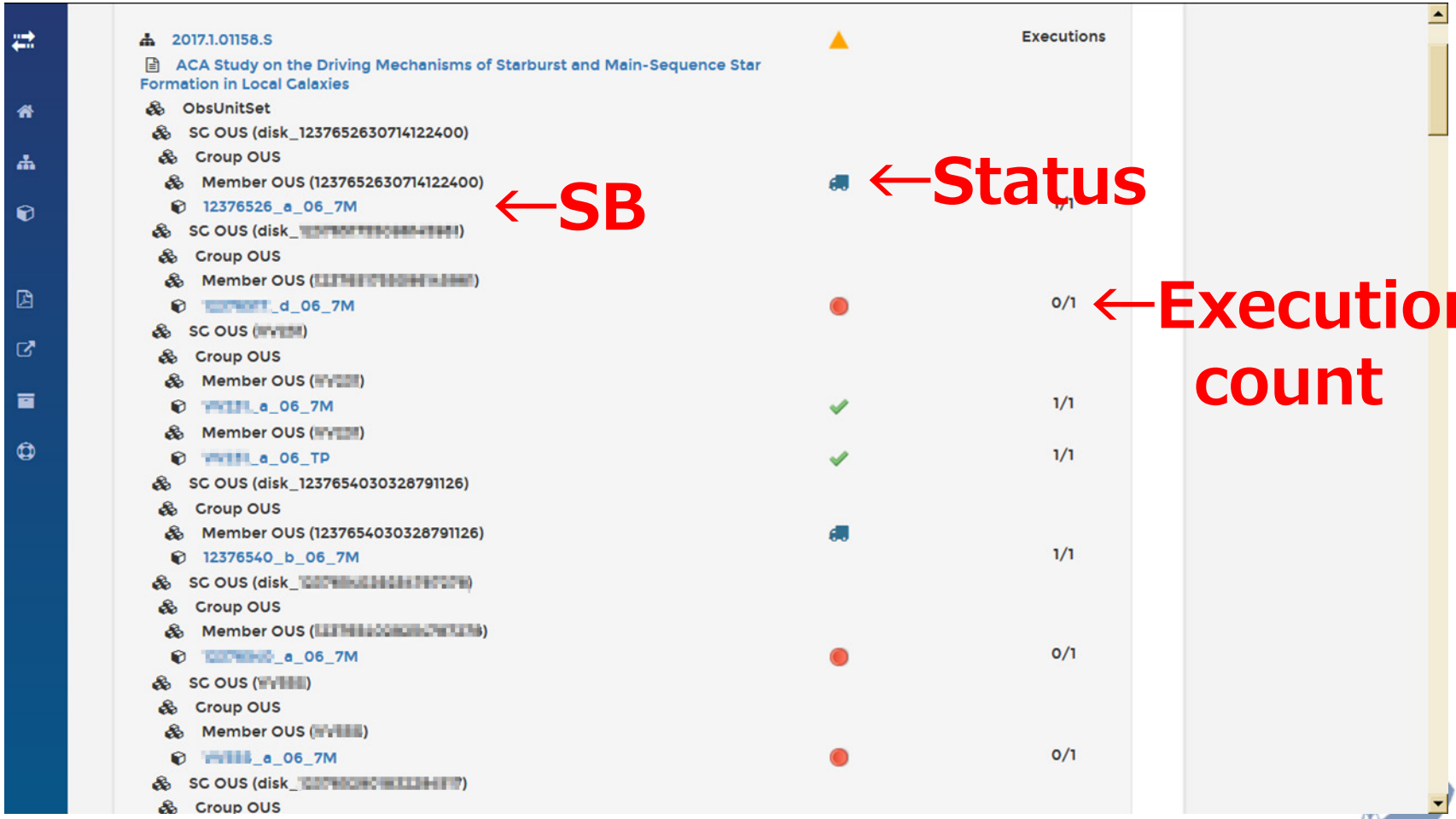
SnooPI: Science Portal



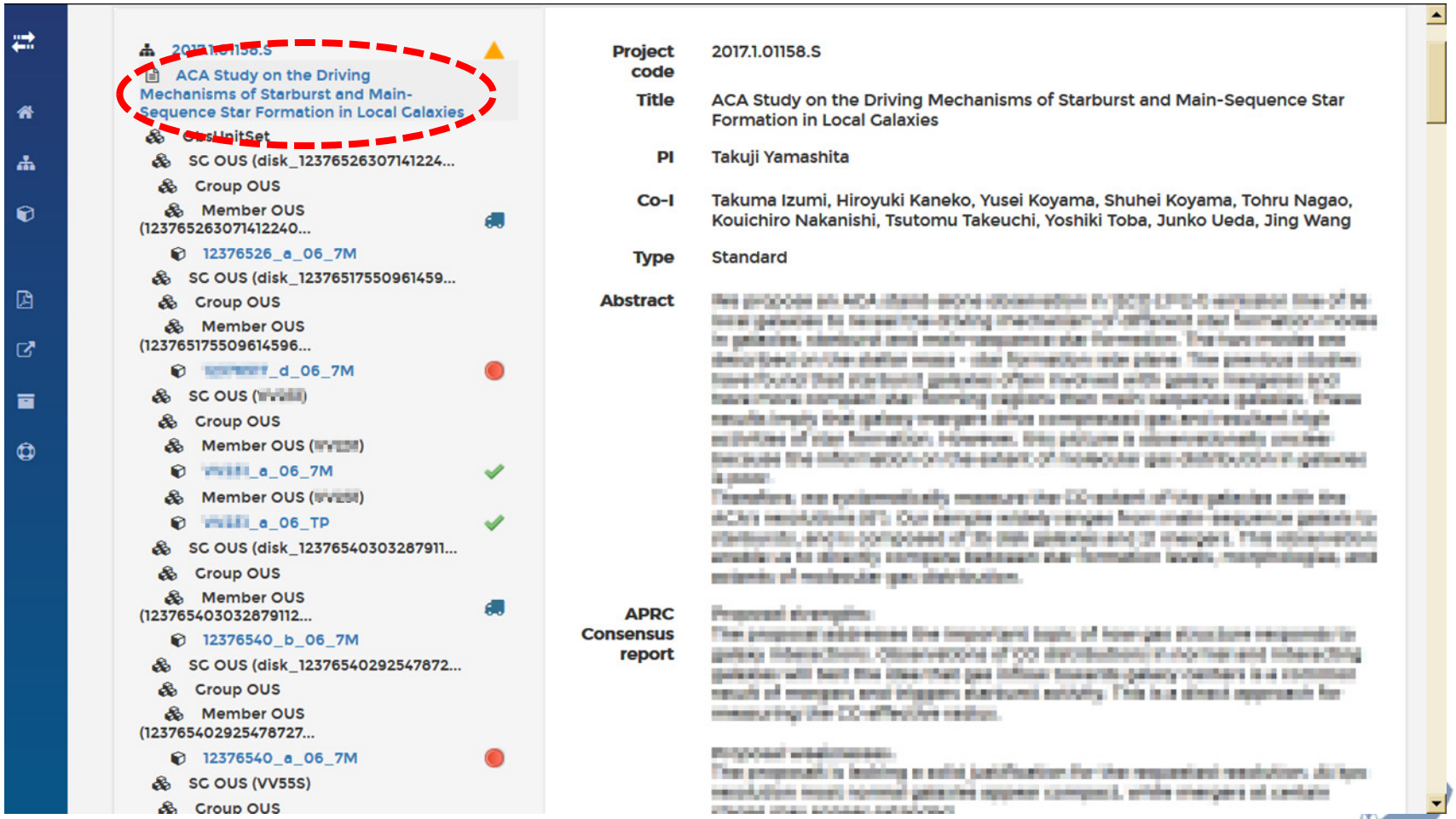
SnooPI: PI projects



SnooPI: project (tree view)



SnooPI: Project overview



QA2 report: Instructions

Instructions

INSTRUCTIONS OVERVIEW

Introduction
Total Power Data
  Pipeline-calibrated TP data
  Manually calibrated TP data
Primary Beam Correction
How to restore the calibrated MeasurementSet for your data

#####

INTRODUCTION

This file describes the content of the tar file you have received. The full data structure is inserted below.

At this stage, we are releasing data after completion of one SB (excuted multiple times if required), so you will find only one member_ouss_id directory. This directory contains this README file and the following directories: calibration, script, qa2, log, product.

- 'calibration' contains the files needed for calibration starting from the initial ms to the fully calibrated data.
- 'script' contains the reduction scripts used to process the initial ms to calibrated data, but also to obtain concatenated data (if more than one execution) and imaging products. There are usually several scripts dealing with different parts of the processing.
In case the calibration was done by the automated pipeline, you will also see the Pipeline Processing Request File (PPR).
The most important script for you is the "scriptForPI.py". See the section "How to restore the calibrated MeasurementSet (MS) for your data" further below. (Note: the ALMA archive may prepend the script name with the MOUS UID.)
- 'product' contains the fits files of the selected image products.

Further information

- ALMA Science (CASA) Pipeline
  https://almascience.nao.ac.jp/processing/science-pipeline
- SnooPI
  https://almascience.nao.ac.jp/observing/snoopi
- QA2 data products (obsolete)
  https://almascience.nao.ac.jp/processing/qa2-data-products