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**ASTROPHYSICS**

HARVARD &amp; SMITHSONIAN

Zhao, Jun-Hui &lt;jzhao@cfa.harvard.edu&gt;

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**Testing SMA to CASA conversion script**

11 messages

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**Thomas, Holly Sarah** <holly.thomas@cfa.harvard.edu>  
To: rtdc@cfa.harvard.edu, Jim Moran <jmoran@cfa.harvard.edu>

Thu, Oct 11, 2018 at 12:46 PM

The new SMA to CASA conversion pipeline (SWARM2CASA) under development needs to be tested.

A robust conversion script would open the door for full calibration in CASA. So if you are converting SMA data to CASA MS format, or just want to experiment, I urge you to give this routine a try.

You can find details on Jun-Hui's pages below.

<https://www.cfa.harvard.edu/~jzhao/SMA-CASA/swarm2casaRelease.html>

<https://www.cfa.harvard.edu/~jzhao/SMA-CASA/swarm2casa.html>

Please contact me if you have any troubles running it on the RTDC.

Cheers,  
Holly

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**Moran, Jim** <jmoran@cfa.harvard.edu>  
To: Jun-Hui Zhao <jzhao@cfa.harvard.edu>

Thu, Oct 11, 2018 at 1:07 PM

Dear Jun-Hui,

Holly's email (below) is her response to my request for more community input on testing your SMA-CASA pipeline.

Jim

[Quoted text hidden]

--

James Moran

D. H. Menzel Professor of Astrophysics Emeritus, Harvard University,  
and Senior Scientist, SAO

60 Garden St. MS42

Cambridge, MA 02138

website: <http://www.cfa.harvard.edu/~jmoran>

phone: 617-495-7477

email: [jmoran@cfa.harvard.edu](mailto:jmoran@cfa.harvard.edu)

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**Zhao, Jun-Hui** <jzhao@cfa.harvard.edu>  
To: "Moran, Jim" <jmoran@cfa.harvard.edu>

Thu, Oct 11, 2018 at 1:13 PM

Thanks, Jim.

Holly's email is good to officially let rtdc members know the links for further testing out this software.

Jun-Hui

[Quoted text hidden]

**Zhao, Jun-Hui** <jzhao@cfa.harvard.edu>

Thu, Oct 11, 2018 at 1:50 PM

To: Holly Sarah <holly.thomas@cfa.harvard.edu>

Cc: "rtdc@cfa.harvard.edu" <rtdc@cfa.harvard.edu>, "Moran, Jim" <jmoran@cfa.harvard.edu>

Hi Holly,

Thanks for this message. The version 1.0.3 should be ready to process SMA data from converting RTDC archived SWARM data to imaging in CASA.

Please let me know if any users have any questions and issues on the pipeline as well as further calibrating and imaging with CASA's tasks and modules.

During the course of trying out this new software, we will create more examples of python scripts for handling SMA data taken on various observing modes.

Regards,

Jun-Hui

[Quoted text hidden]

**Tomasz (Tomek) Kaminski** <tomasz.kaminski@cfa.harvard.edu>

Wed, Oct 24, 2018 at 2:17 PM

To: Jun-Hui Zhao <jzhao@cfa.harvard.edu>

Hi Jun-Hui

I wanted to give a try the conversion script but it failed very early on. I did my test on rtdc7 and on a dataset I earlier calibrated and imaged in MIR and CASA (so I could compare). I know this dataset has no internal problems. This were my input lines:

```
set INPUT_FILE_DIR = /sma/data/science/mir_data/
```

```
set INPUT_FILE_NAME = 181002_03:55:28
```

```
setenv OUTPUT_FILE_PREFIX SMAtest0
```

but the script failed with the log copied below. Any idea what I did wrong?

Tomek

```
[tkaminsk@rtdc7 band7subcom2]$ ./swarm2casa.csh
```

```
Wed Oct 24 14:09:10 EDT 2018
```

```
Start swarm2casa.csh script -
```

```
SWARM2CASA pipeline version: SMA-SWARM2CASA 1.0.3 (Smithsonian Astrophysical Observatory
2018-9-03 for test)
```

```
loaded from PATH=/opt/sma/SWARM2CASA
```

```
OUTPUT_FILE_PREFIX= SMAtest0
```

```
Reading LSB data -
```

```
#####
```

```
# Welcome to the Smithsonian Astrophysical Observatory using swarm2casa - #
```

```
# A Pipeline: Converting SMA SWARM Data to CASA MeasurementSet: #
```

```
# swarm2read ..... DRX version 1.1.1-beta: 2018-09-10 #
```

#####

Get pathname, input- and output-filenames, sbidx, optidx .....

Handling LSB data -

Warning: Applying no online flagging and no Tsys ...  
wideband patch.....swarmDrxP version 1.4.2-beta: 2018-09-03

\*\*\*\*\*  
\* Observing Date: 2018 Oct 02 \*  
\*\*\*\*\*

principal investigator.....SMA

Geocentric coordinates (meter):  
SMA-ANTID x y z = 1 -5.7024 -18.9838 15.6098  
SMA-ANTID x y z = 2 -0.5089 -25.1506 1.2805  
SMA-ANTID x y z = 3 0.0000 0.0000 0.0000  
SMA-ANTID x y z = 4 2.7356 -23.7429 -7.7552  
SMA-ANTID x y z = 5 1.9559 -7.4637 -5.5016  
SMA-ANTID x y z = 6 -17.9164 -59.5564 30.0692  
SMA-ANTID x y z = 7 -4.4426 -10.0932 12.2381  
SMA-ANTID x y z = 8 4.4421 -63.8724 -21.8370

handling header variables.....  
number of integrations.....0935  
number of c1 + SWARM Spectra.....5  
number of polarizations.....1: XX--non polarization  
number of receivers.....2: rx1->340, rx2->400  
number of sidebands.....2: lsb & usb  
number of baselines.....28  
number of antennas.....8  
number of channels.....65537  
solving for antenna-based Tsys...  
Segmentation fault (core dumped)

Reading USB data -

#####  
# Welcome to the Smithsonian Astrophysical Observatory using swarm2casa - #  
# A Pipeline: Converting SMA SWARM Data to CASA MeasurementSet: #  
# swarm2read ..... DRX version 1.1.1-beta: 2018-09-10 #  
#####

Get pathname, input- and output-filenames, sbidx, optidx .....

Handling USB data -

Warning: Applying no online flagging and no Tsys ...  
wideband patch.....swarmDrxP version 1.4.2-beta: 2018-09-03

\*\*\*\*\*  
\* Observing Date: 2018 Oct 02 \*  
\*\*\*\*\*

principal investigator.....SMA

Geocentric coordinates (meter):

SMA-ANTID x y z = 1	-5.7024	-18.9838	15.6098
SMA-ANTID x y z = 2	-0.5089	-25.1506	1.2805
SMA-ANTID x y z = 3	0.0000	0.0000	0.0000
SMA-ANTID x y z = 4	2.7356	-23.7429	-7.7552
SMA-ANTID x y z = 5	1.9559	-7.4637	-5.5016
SMA-ANTID x y z = 6	-17.9164	-59.5564	30.0692
SMA-ANTID x y z = 7	-4.4426	-10.0932	12.2381
SMA-ANTID x y z = 8	4.4421	-63.8724	-21.8370

handling header variables.....

number of integrations.....0935

number of c1 + SWARM Spectra.....5

number of polarizations.....1: XX--non polarization

number of receivers.....2: rx1->340, rx2->400

number of sidebands.....2: lsb & usb

number of baselines.....28

number of antennas.....8

number of channels.....65537

solving for antenna-based Tsys...

Segmentation fault (core dumped)

=====

The start-up time of CASA may vary  
depending on whether the shared libraries  
are cached or not.

=====

IPython 5.1.0 -- An enhanced Interactive Python.

CASA 5.3.0-143 -- Common Astronomy Software Applications

--> CrashReporter initialized.

2018-10-24 18:09:25	WARN	importuvfits::utils::verify	Argument fitsfile failed to verify.
2018-10-24 18:09:25	WARN	importuvfits::utils::verify	Some arguments failed to verify!
2018-10-24 18:09:25	WARN	importuvfits::utils::verify	Argument fitsfile failed to verify.
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2018-10-24 18:09:25	WARN	importuvfits::utils::verify	Some arguments failed to verify!

```

2018-10-24 18:09:25  WARN  importuvfits::utils::verify  Some arguments failed to verify!
2018-10-24 18:09:25  WARN  importuvfits::utils::verify  Argument fitsfile failed to verify.
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2018-10-24 18:09:25  WARN  importuvfits::utils::verify  Some arguments failed to verify!
2018-10-24 18:09:25  WARN  importuvfits::utils::verify  Argument fitsfile failed to verify.
2018-10-24 18:09:25  WARN  importuvfits::utils::verify  Some arguments failed to verify!
2018-10-24 18:09:25  WARN  concat::utils::verify  Argument vis failed to verify.
2018-10-24 18:09:25  WARN  concat::utils::verify  Some arguments failed to verify!
hit return-key to listobs&plotms check the dual rx data: SMAtest0.ms
2018-10-24 18:09:31  WARN  listobs::utils::verify  Argument vis failed to verify.
2018-10-24 18:09:31  WARN  listobs::utils::verify  Some arguments failed to verify!
2018-10-24 18:09:31  SEVERE  plotms:::  Input file not found:
2018-10-24 18:09:31  SEVERE  plotms:::+  /data4/tkaminsk/SMAdata/CKVuSurvey/band7subcom2/
SMAtest0.ms
hit return-key to quit the script

```

A single CASA measurementSet data output is produced:  
SMAtest0.ms  
Done, congratulation! exit from the script!  
Wed Oct 24 14:12:51 EDT 2018

Tomasz (Tomek) Kaminski  
SubMillimeter Array fellow  
\* \* \*  
Harvard-Smithsonian  
Center for Astrophysics  
60 Garden Street, MS 78  
Cambridge, MA 02138

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**Zhao, Jun-Hui** <jzhao@cfa.harvard.edu>  
To: Tomasz Kaminski <tomasz.kaminski@cfa.harvard.edu>

Wed, Oct 24, 2018 at 3:04 PM

Hi Tomasz,  
I will take look at your data and let you know as soon as I have solution.  
Jun-Hui

[Quoted text hidden]

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**Zhao, Jun-Hui** <jzhao@cfa.harvard.edu>  
To: Tomasz Kaminski <tomasz.kaminski@cfa.harvard.edu>

Wed, Oct 24, 2018 at 3:34 PM

Hi Tomasz,

I repeated the error that you got. Looks like the data header has some issues that need to be fixed. I am working on the patch now. Thanks, Jun-Hui

[Quoted text hidden]

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**Zhao, Jun-Hui** <jzhao@cfa.harvard.edu>

Fri, Oct 26, 2018 at 8:41 AM

To: Tomasz Kaminski <tomasz.kaminski@cfa.harvard.edu>

Hi Tomasz,

I am still working on your data set and the problem occurs while process the Tsys. Do you know any log report concerning the observing operation? If you have the observing log, would you please send me a copy. I would be help us to identify the error and make a patch to fix it.

Thanks, Jun-Hui

[Quoted text hidden]

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**Tomasz (Tomek) Kaminski** <tomasz.kaminski@cfa.harvard.edu>

Fri, Oct 26, 2018 at 8:51 AM

To: Jun-Hui Zhao <jzhao@cfa.harvard.edu>

Hi Jun-Hui,

this was the easiest possible data file. Most tracks have much more problems. The log is below.

Best wishes

Tomek

Observing report

[ [observing plan entry for this observation](#) ]

Summary

source(s) CK Vul

requested weather PWV<2.5mm

start - end (duration) 2018 Oct 02, 03:18:03 - 11:10:04 UTC ( 7h 52m)

observing script 2018A-S005\_20181001.pl

data [+ /data/science/mir\\_data/181002\\_03:55:28/](#) -- [data summary](#)

directories [data retrieval and reduction](#)

antennas 1 2 3 4 5 6 7 8

array subcompact

configuration + show detail

supplemental plots weather temps:iflo temps:cryo pointing:az tsys:lowfreq rx:lowfreq iflo:lowfreq  
phasemonitor temps:rx pointing:el tsys:highfreq rx:highfreq iflo:highfreq  
rx\_stability\_1 rx\_stability\_2

		rest freq (GHz)	Gunn freq (GHz)	mult	harm	YIG freq (GHz)
tuning	Rx A	<b>351.800 (USB)</b>	<b>113.604502</b>	<b>3</b>	<b>14</b>	<b>8.106822</b>
	Rx B	<b>359.800 (USB)</b>	<b>87.203453</b>	<b>4</b>	<b>14</b>	<b>6.221032</b>

assessment satisfactory  
 Tau and phase seemed excellent. Sufficient calibration data exist. -GP

#### Setup and Scheduling Notes

```
observe -s CKVuI -r 19:47:38.072 -d 27:18:45.162 -e 2000 -v -11 dopplerTrack -S CKVuI -r 351.8 -u -s4 -h 14
-R B -r 359.8 -u -s4 This script is running the automatic pointing software.
```

This script can start as soon as possible during priming and will do this: HST Event 16:30 Start script. It loops on CKVuI (2015+371, mwc349a cal) 23:45 Neptune (flux) 23:55 3c84 (bandpass) 01:10 Script stops.

+ show Priming Report

#### Operator Comments

Operators: 1st shift: Johnathan and Ryan

#### Timeline

Time lost during this observation: 5.0 antenna-hours (out of 62.9)

time (UTC)	op.	event
03:18	jlaron	observing report opened
03:18-03:55	jlaron	TIME LOST type: Needed to finish priming ants: 1,2,3,4,5,6,7,8 data: lost details: Antenna 4 and 8 gave problems during priming causing it to run long. action taken: Finished priming.
03:55	jlaron	Started 2018A-S005_20181001.pl with a -b
04:09	jlaron	killed and restarted 2018A-S005_20181001.pl with -k -b -f
06:53	jlaron	High azimuth drive motor current on Antenna 1: 43.33 amps!
08:43	jlaron	Desaturated RxB on antenna 6.
11:09	jlaron	Script ended.
11:10	jlaron	observing report closed

Tomasz (Tomek) Kaminski  
 Submillimeter Array fellow

\* \* \*

Harvard-Smithsonian  
 Center for Astrophysics  
 60 Garden Street, MS 78  
 Cambridge, MA 02138

[Quoted text hidden]

**Zhao, Jun-Hui** <jzhao@cfa.harvard.edu>  
 To: Tomasz Kaminski <tomasz.kaminski@cfa.harvard.edu>

Fri, Oct 26, 2018 at 10:34 AM

Thanks, Tomasz.

The log report is helpful. I noticed that either the baseline loop or the baseline-based Tsys loop or both has an issues to prevent from processing the data through. I will pay more attention at the UTC 4:09, 6:53 and 8:43 at which the online system seemed to have some issues that may leave a bug in the header files of the dataset.

Jun-Hui

[Quoted text hidden]

---

**Zhao, Jun-Hui** <jzhao@cfa.harvard.edu>  
To: Tomasz Kaminski <tomasz.kaminski@cfa.harvard.edu>

Mon, Nov 5, 2018 at 3:07 PM

Hi Tomasz:

There are several issues in your data. I have hard coded in the patches in the swarm2casa pipeline software.

Please give a try again.

Attached are few files:

- 1) screenReport.log ----- log of the message prompted on the screen that I captured while run test on rtdc9. Please check if you can get the same report.
- 2) casa-20181105-192311.log----- log output from the CASA while converting SMA data into measurementSet, header check and graphic inspection.
- 3) mwc349a.jpg----- plot of the raw spectrum MWC349a; in addition to the default graphic examination of all the 16 spectral chunks for field 0, I examined  
spw 12 of field 2 (mwc349a). The H26alpha line is present.

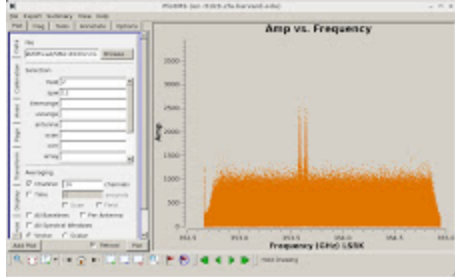
Please let me know if you have any further questions and troubles to process the data in CASA.

Jun-Hui


[Quoted text hidden]


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### 3 attachments



**mwc349a.jpg**  
241K

 **screenReport.log**  
18K

 **casa-20181105-192311.log**  
75K