

Technical Operations, R&D



JIVE

Joint Institute for VLBI
ERIC

Current hardware

1	100 Gbps	since Jan 2020
17	FlexBuff	~4.6PB
3	Mark6	
27	Mark5	
1012	SFXCcores	~20x2Gbps e-VLBI, hopefully 12x4Gbps

amplitude versus frequency

unique: sess319.X8192/11:50:30.00/J1800+3848

Pol=LL,RR;Nsub=16;;Ch=*

[Vector avg'ed 08-Nov-2019/11:48:01.000->08-Nov-2019/11:52:59.000]

FT036

data: FT036_No0016.ms [DATA]

verkouter@<??> 2020-04-29T11:48:10

page: 1/1

8 Gbps

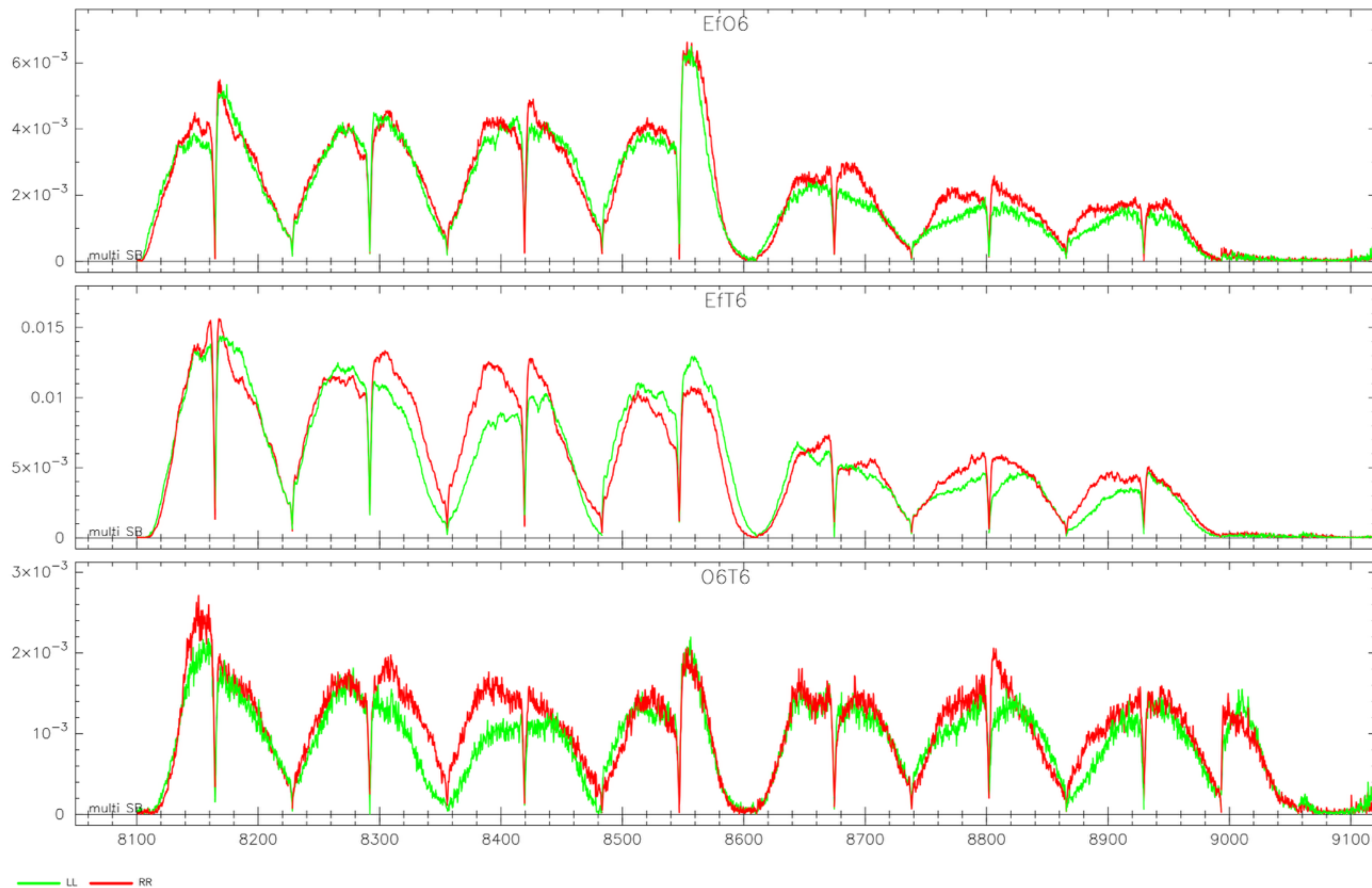
Nov 2019 X-band

Ef, 06, T6

Km rec fail

DBBC2:

- wastro
- 32 x 64 MHz



Version 5 released

Introduces “sliced integrations” (sub-)
1 integration divided > 1 node

less memory needed / node

longer t_{int} possible

better for $\gg n_{\text{phase_center}}$

faster turnaround of data

more responsive real-time plots

R&D / Projects / JUMPING JIVE

- `pySCHED` (refactoring `SCHED` to Python)
 - Delivered to EC end of Nov 2019
 - 63kLOC converted, 223kLOC FORTRAN remain
 - JIVE continues support/bug fixes/improvements
- Important new features:
 - automatic catalog synchronization w/ master
 - DBBC2 hardware support
 - Enable dynamic KEYIN schedule "template":
 - embed executable Python code to express complex schedules
 - VEX2 schedule format output
 - added: scan INTENT from scheduling through post processing

R&D / Projects / JUMPING JIVE

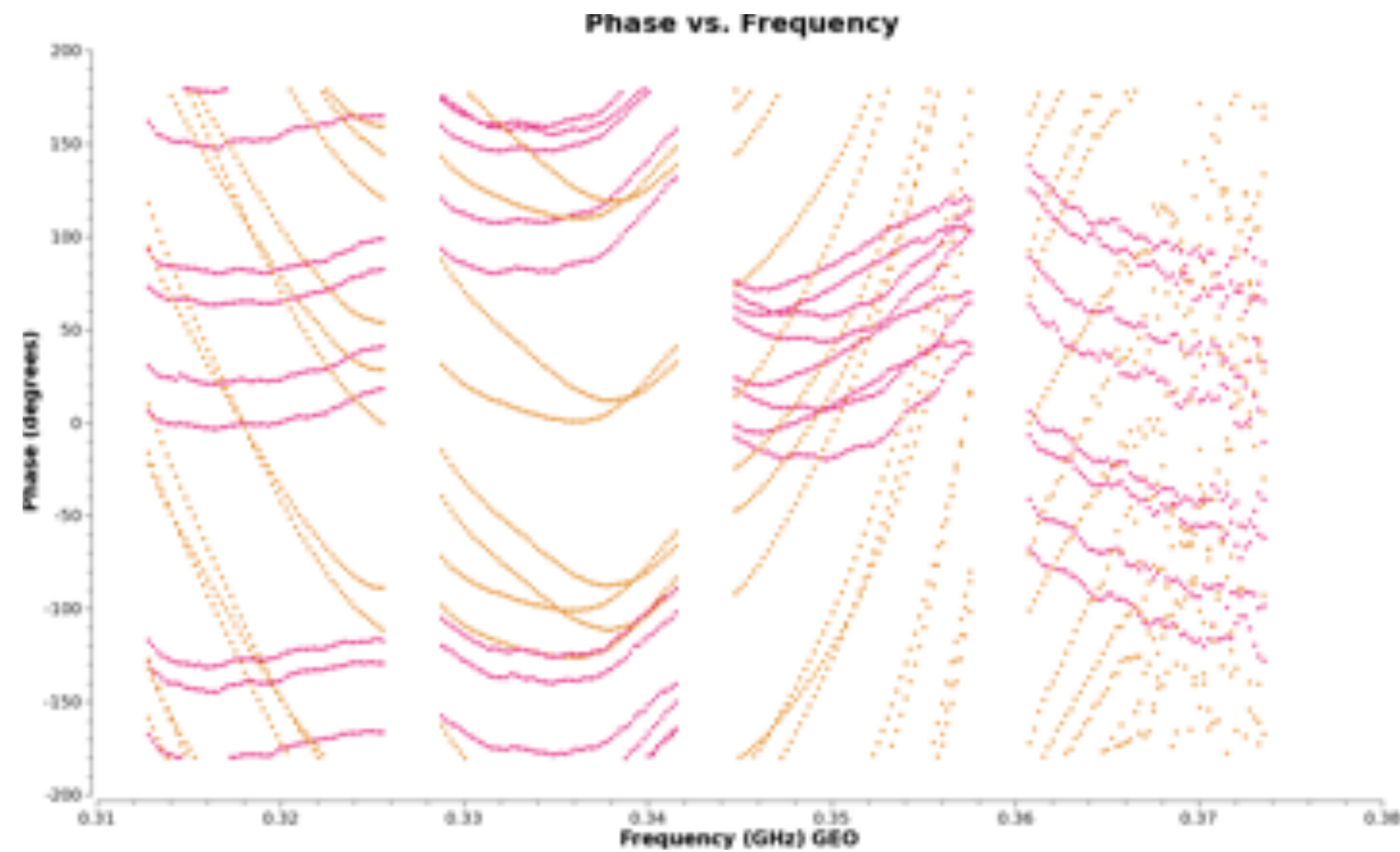
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Bob Eldering/ eldering@jive.eu

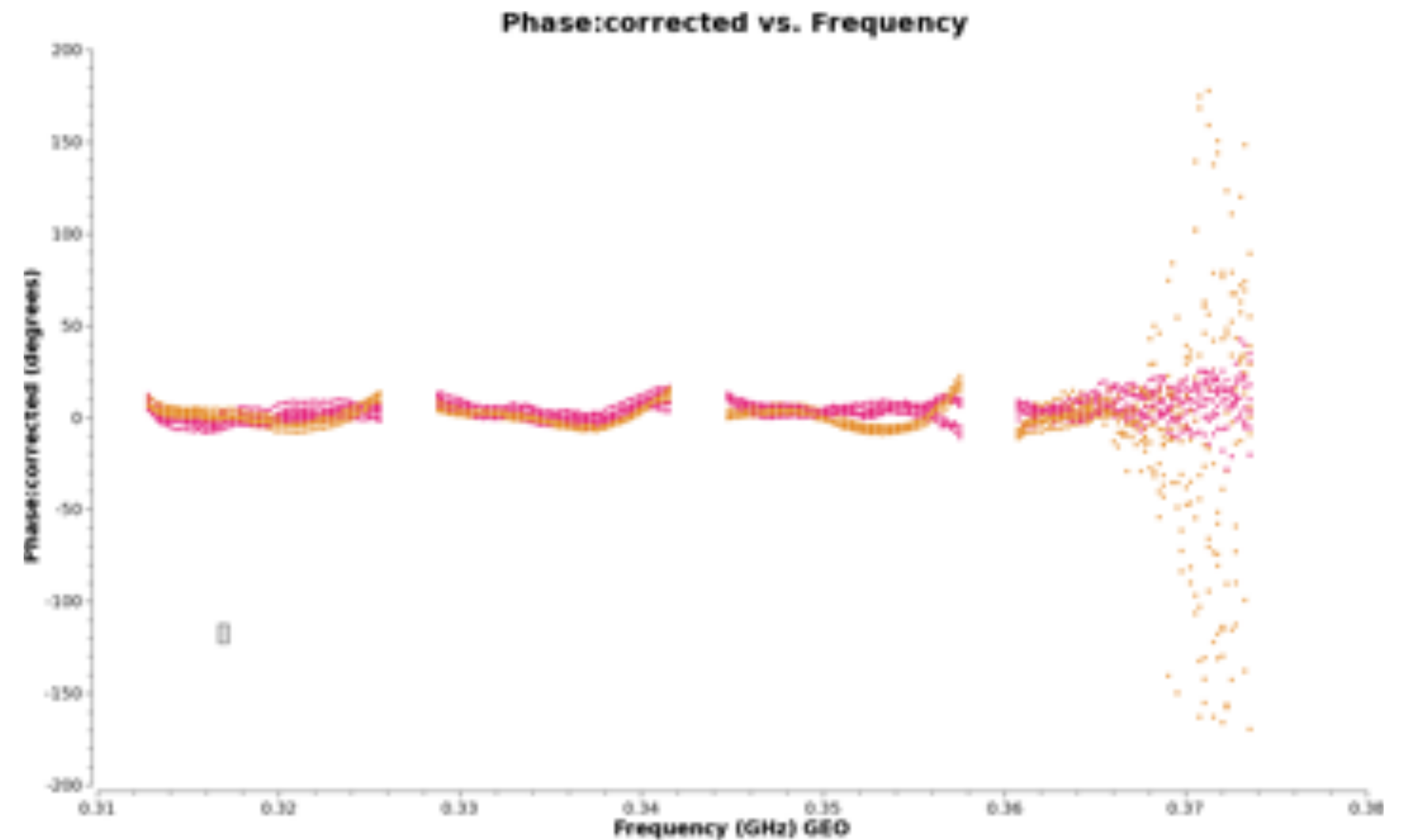
R&D / Projects / RadioNet RINGS

- fringe fitters under active development
 - Delivered to EC end of Feb 2020
 - wide-band, widely separated bands (VGOS!),
dispersive delay (low frequency - LOFAR et al)

Before dispersive delay correction:



After!



Des Small / small@jive.eu

R&D / Projects / RadioNet RINGS

- fringe fitters under active development
 - Delivered to EC end of Feb 2020
 - wide-band, widely separated bands (VGOS!), dispersive delay (low frequency – LOFAR et al)
 - **JIVE continues support/bug fixes/improvements**
- Could enter CASA mainstream this year

R&D / Projects / ESCAPE

- WP3 Open source Software and Service Repository
 - CASA6 Jupyter kernel with added scripts to load (EVN) calibration data



The notebook interface to CASA was developed by Aard Keimpema at the [Joint Institute for VLBI ERIC \(JIVE\)](#). Installation in the sandbox interface (based on [tmpnb](#)) was done by Tammo Jan Dijkema at [ASTRON](#). This work is a part of the [ASTERICS](#) project, Astronomy ESFRI & Research Infrastructure Cluster ASTERICS - 653477.



This notebook interface was built on top of CASA 5.4.0. Adaptions were made to run it on a newer version of Python than the one distributed with CASA. Future development of this notebook, or upgrading the underlying CASA version, is currently being planned.

```
In [1]: casa['build']['version']
```

```
Out[1]: '5.4.0-68'
```

The current notebook is taken from the [VLA Continuum Tutorial](#). The dataset inside this sandbox has been averaged down considerably in size, the original was 3GB data, so the results will be worse than in the tutorial.

NB: This container is for demonstration purposes only, it will be deleted automatically after 5 minutes of inactivity

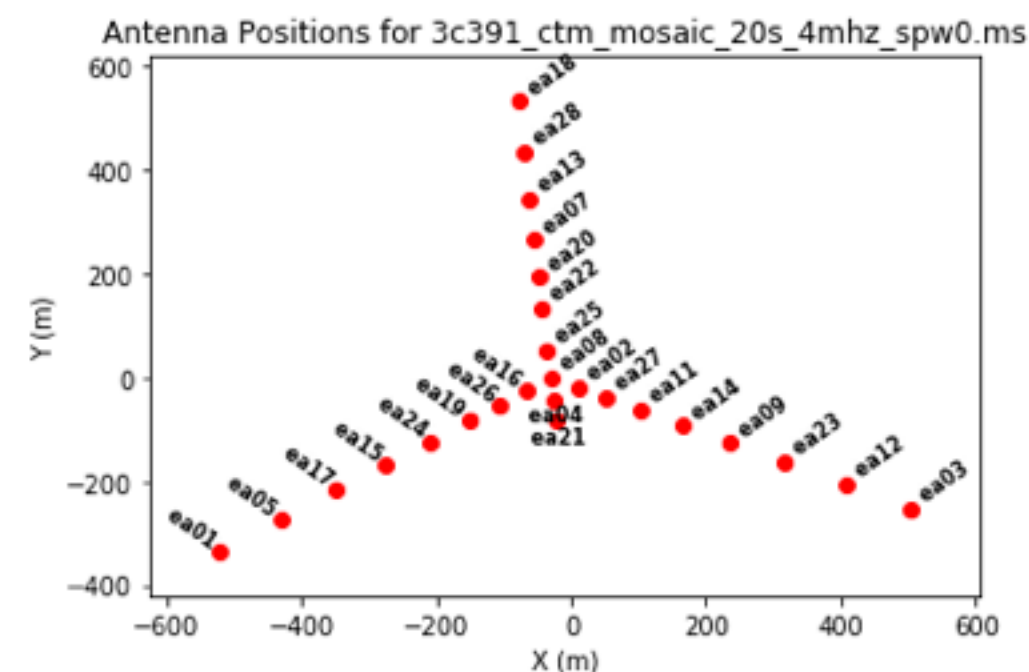
Tutorial, inspect the data

To get a sense of the array, as well as identify an antenna for later use in calibration, we use the task `plotants`.

```
In [2]: plotants(vis='3c391_ctm_mosaic_20s_4mhz_spw0.ms',
              figfile='plotants_3c391_antenna_layout.png')
clearstat() # This removes the table lock generated by plotants in script mode
```

```
Number of points being plotted: 26
```

```
/usr/local/lib/python2.7/dist-packages/matplotlib/figure.py:457: UserWarning: matplotlib is currently using a non-GUI backend, so cannot show the figure
"matplotlib is currently using a non-GUI backend, "
```



Show log

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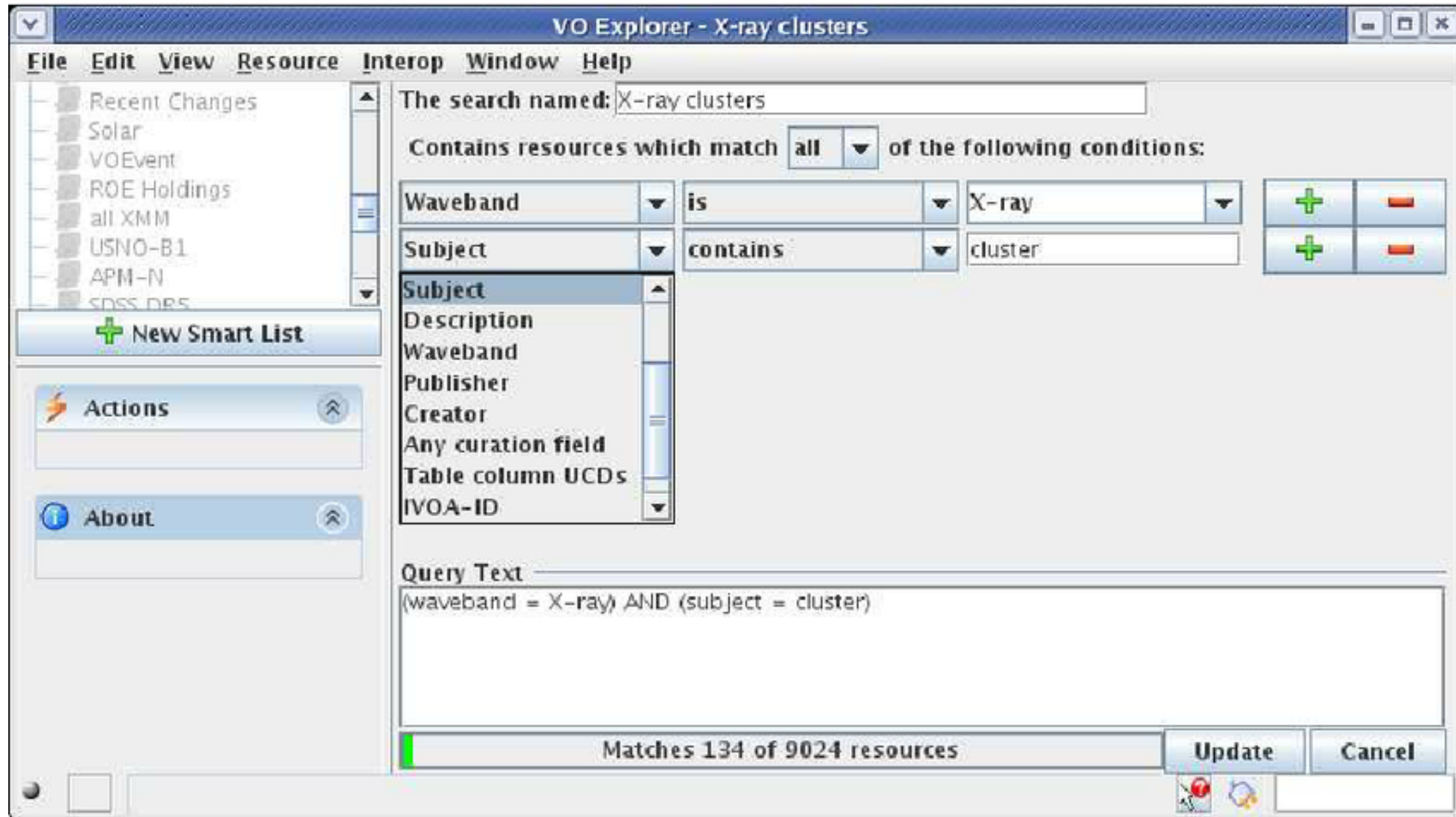
R&D / Projects / ESCAPE

- WP3 Open source Software and Service Repository
 - CASA6 Jupyter kernel with added scripts to load (EVN) calibration data
 - Improving/debugging CASA VLBI related tasks, such as `importfitsidi` and working on various calibration tasks

Mark Kettenis / kettenis@jive.eu

R&D / Projects / ESCAPE

- WP4 Connecting ESFRI projects to EOSC through VO framework
- Enable access to EVN archive @ JIVE through the Virtual Observatory (VO)



R&D / Projects / ESCAPE

- WP4 Connecting ESFRI projects to EOSC through VO framework
- Enable access to EVN archive @ JIVE through the Virtual Observatory (VO)
- Local prototype VO service up and running for experimenting:
 - JIVE involved in defining missing standard for visibility data

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R&D / Useful stuff

FlexBuff manager (on ccs)

File manager | Experiments

Selection

Type FlexBuff Reload Host aribox (10.88.0.24)

Disk usage

Total: 210.9T Used: 168.4T Free: 42.49T

Experiment	Station	Scan	Size
EY029B			46.00G
FR051			1.338T
FR054			1.977T
FR055			999.2G
FR060			1.109T
FT033			209.3G
GA042			1.431T
GA043A			2.105T
GK049E			630.0G
GK049F			317.3G
GK49LE			4.992T
GK49LF			3.296T
GS044B			2.737T
N16L3			206.1G
N17C1			651.3G
N17K1			1.981T
N17L1			1.164T
N17P1			262.1G
N19C3			404.6G
N19K3			957.3G
N19L3			1.163T
N19M3			815.0G
N19SX2			329.1G
Q17014			328.7G

Selection size: no selection Mark6 format Show file chunks

Selection

Type FlexBuff Reload Host mark6-1 (10.88.0.81)

Disk usage

Total: 853.0G Used: 2.114G Free: 807.5G

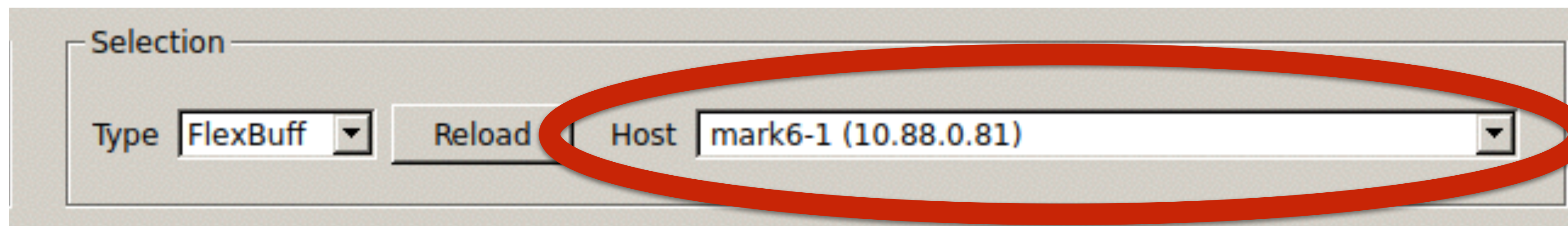
Experiment	Station	Scan	Size
GA043			9.51T
GA043A			21.63T
Hn			7.328T
			19G
			4G
			4G
			19G
			4G
			4G
			4G
			43.19G
			172.8G
			43.19G
			43.19G
			69.58G
			70.54G
			70.54G
			64.78G
			69.58G
			70.54G
			115.2G
			43.19G
			43.19G
			69.58G
			70.54G

Selection size: 7.328T (99 items) Mark6 format Show file chunks

- Scan check
- Copy to ...
- Clear selection Esc
- Rename

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R&D / Useful stuff



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jive5ab 3.0.0

R&D / jive5ab 3.0.0

- **Organization:**
 - github + CMake
- **New feature:**
 - record VDIF frames in separate recordings (configurable)
 - **m6sg_mount** - mount/unmount/initialize Mark6 disk packs from command line
- **Fixes:**
 - **scan_check?** with high data rate recordings
 - partial last block written
- **Documentation improved:**
 - section on Mark6/FlexBuff, split VDIF recording
 - missing, new commands documented
 - correct availability (e.g. **scan_set=** on FlexBuff/Mark6)

Thanks for your
attention!