Technical Operations, R&D

JIVE
Joint Institute for VLBI ERIC

Current hardware

1	100 Gbps	
17	FlexBuff	~4.6PB
3	Mark6	
27	Mark5	
1012	SFXCcores	

Current hardware

17 FlexBuff

Current hardware

17 FlexBuff

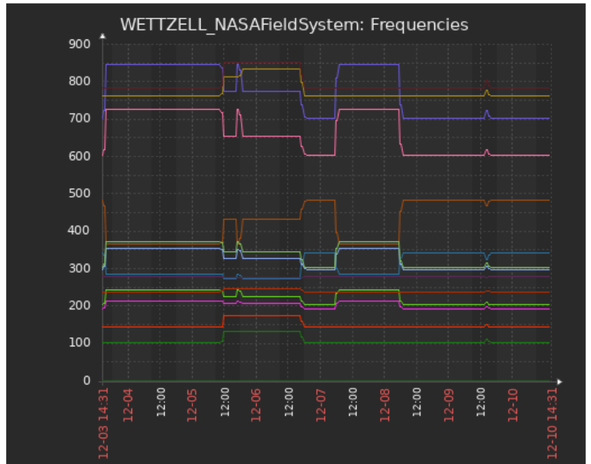
~~~4-6PB~~ → SOON ~9-10PB *Nov 2021*

Station + JIVE action + coordination required (well) before then!
~~~

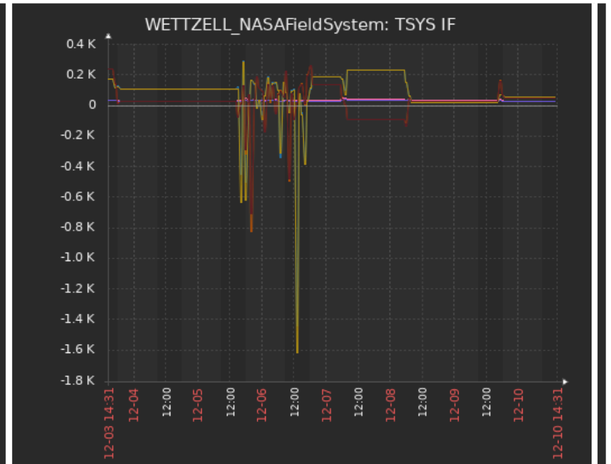
R&D / Projects / JUMPING JIVE

Project end date now 31 July 2021 #COVID19

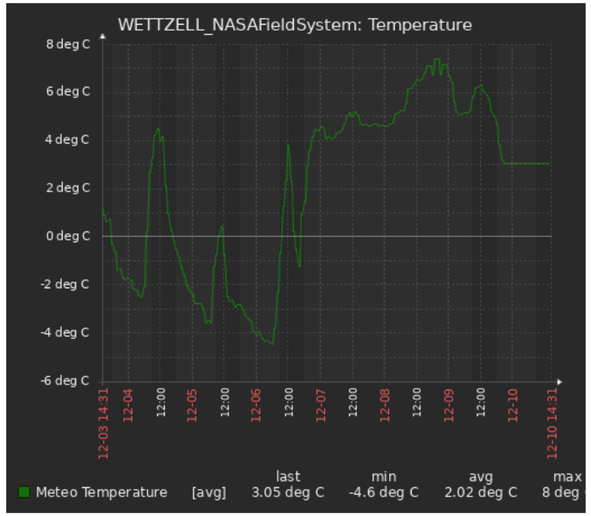
- pySCHED (refactoring SCHED to Python)
  - Some bug/user reports came in and were handled



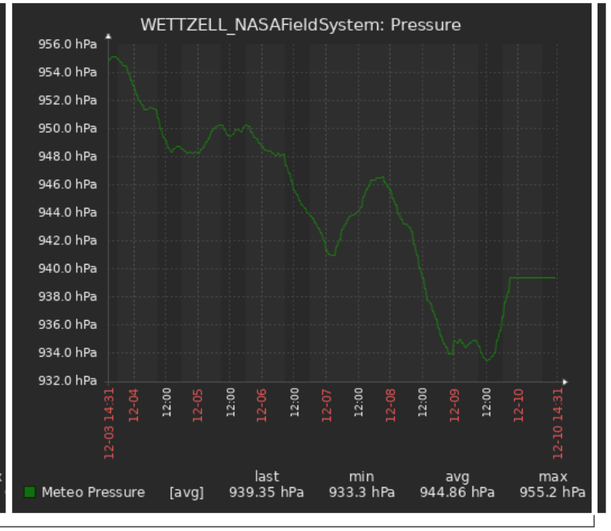
		last	min	avg	max
Frequency CH01	[avg]	102.99	102.99	108.9	132.99
Frequency CH02	[avg]	142.99	142.99	148.9	172.99
Frequency CH03	[avg]	342.99	272.99	303.71	342.99
Frequency CH04	[avg]	482.99	365.75	419.87	482.99
Frequency CH05	[avg]	602.99	602.99	668.65	725.75
Frequency CH06	[avg]	702.99	702.99	781.54	845.75
Frequency CH07	[avg]	762.99	762.99	775.83	832.99
Frequency CH08	[avg]	782.99	782.99	796.78	852.99
Frequency CH09	[avg]	192.99	192.99	204.48	212.75
Frequency CH10	[avg]	202.99	202.99	225.52	242.75
Frequency CH11	[avg]	237.99	237.99	239.57	245.99
Frequency CH12	[avg]	277.99	275.99	277.6	277.99
Frequency CH13	[avg]	297.99	297.99	328.33	352.75
Frequency CH14	[avg]	302.99	302.99	343.01	372.75
Frequency CH15	[avg]	0	0	0	0
Frequency CH16	[avg]	0	0	0	0



		last	min	avg	max
IF1 system temperature	[avg]	27	-22	33.58	239
IF2 system temperature	[avg]	23	21	28.75	116
IF3 system temperature	[avg]	52	-34.86 K	84.95	877
IF4 system temperature	[avg]	48	-13.95 K	18.16	985
Systen Temperatures IF1	[avg]	27.35	-23.13	33.64	238.83
Systen Temperatures IF2	[avg]	23.45	20.88	28.64	116.05
Systen Temperatures IF3	[avg]	51.71	-34.86 K	81.12	877.3
Systen Temperatures IF4	[avg]	48.45	-13.95 K	18.02	985.11



		last	min	avg	max
Meteo Temperature	[avg]	3.05 deg C	-4.6 deg C	2.02 deg C	8 deg



		last	min	avg	max
Meteo Pressure	[avg]	939.35 hPa	933.3 hPa	944.86 hPa	955.2 hPa

Zabbix 4.0.12. © 2001–2019, Zabbix SIA

R&D / Projects / JUMPING JIVE

- EVN monitoring system
  - Last remaining deliverable in JJ WP8
    - Technische Universität München
  - Wettzell monitoring system for geodetic obs
    - system properties (T_sys, weather, …) stored in database
    - server located at JIVE

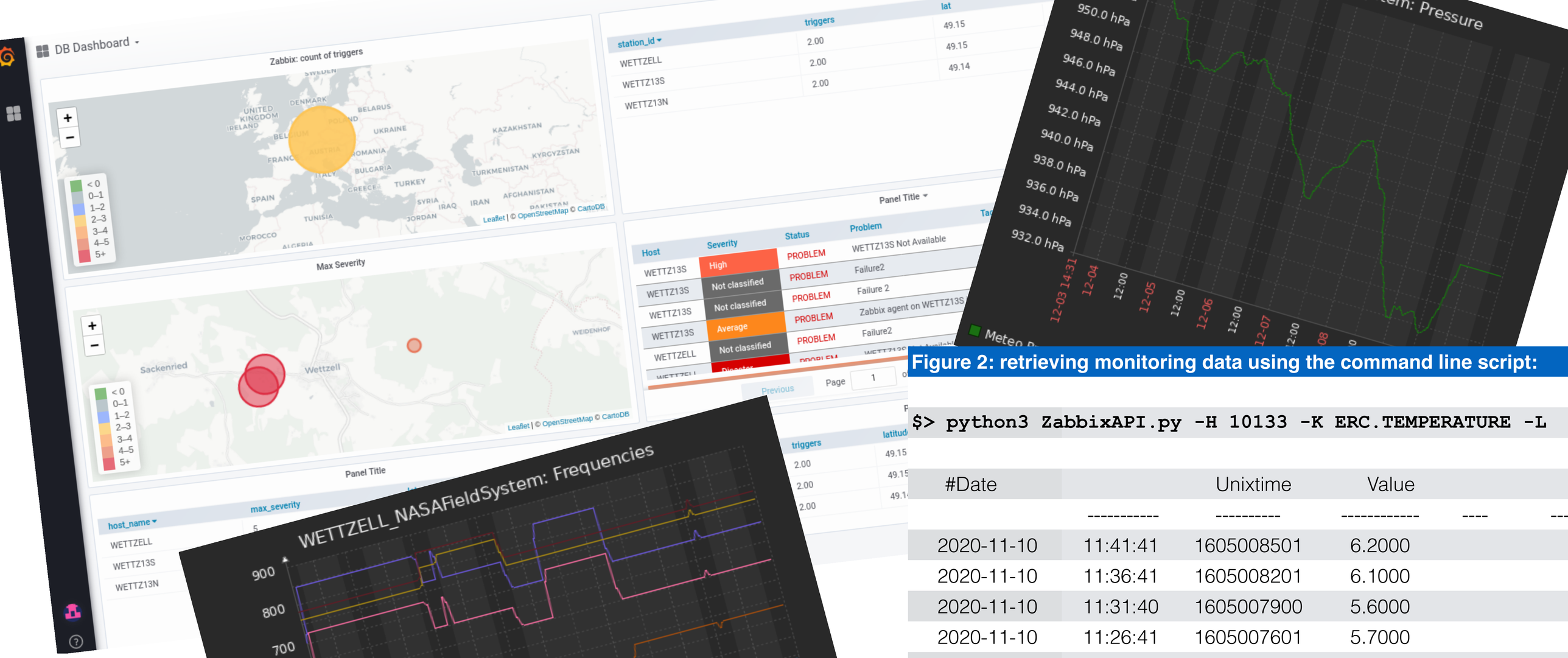


Figure 2: retrieving monitoring data using the command line script:

```
$> python3 ZabbixAPI.py -H 10133 -K ERC.TEMPERATURE -L
```

#Date		Unixtime	Value		
2020-11-10	11:41:41	1605008501	6.2000		
2020-11-10	11:36:41	1605008201	6.1000		
2020-11-10	11:31:40	1605007900	5.6000		
2020-11-10	11:26:41	1605007601	5.7000		
2020-11-10	11:21:41	1605007301	5.6000		
2020-11-10	11:16:41	1605007001	5.3000		
2020-11-10	11:11:40	1605006700	5.5000		
2020-11-10	11:06:40	1605006400	5.3000		
2020-11-10	11:01:40	1605006100	5.1000		
2020-11-10	10:56:41	1605005801	5.2000		

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    - Technische Universität München
  - Wettzell monitoring system for geodetic obs
    - system properties (T_sys, weather, …) stored in database
    - hardware located at JIVE
  - **we'd like you to submit station's log data!**

R&D / CASA VLBI work (past)

Release Information

Release Notes CASA 5.7 / 6.1

Known Issues

Using CASA

Global Task List

Global Tool List

CASA Fundamentals

External Data

Calibration & Visibilities

Imaging & Analysis

Pipeline

Simulations

Parallel Processing

Memo Series & Knowledgebase

Release Notes CASA 5.7 / 6.1

Summary of new features in this release of CASA

This is the documentation for CASA 5.7/6.1. Changes compared to the CASA 5.6/6.0 release are listed below.

https://casa.nrao.edu/casadocs-devel/stable/introduction/release-notes-610

Highlights (details below)

- CASA 6.1 is available as both a full installation (the tarball, as has historically been provided) and as [illegible] and has been updated from Python 2.7 to Python 3.6. CASA 5.7 is scientifically equivalent and remains Python 2.7 compliant.
- A new task **sdintimaging** is available for joint deconvolution of Single Dish and Interferometer data.
- A new task **sdtimeaverage** is available for averaging single-dish spectral data over specified time.
- A new single-dish spectral imaging mode, *'cubesource'*, is available in the task **tsdimaging**.
- A new parameter *corrdepflags* has been added to the **gaincal**, **bandpass**, and **fringefit** tasks to permit more control of flagging subsets of correlations.
- The **fringefit** task now includes support for dispersive delays.
- The CASA simulator now uses **tclean** instead of clean.
- The ability to correct for heterogeneous antenna pointing offsets stored in the POINTING sub-table of the MS has been added to **tclean** (*gridder='awproject'*).
- **statwt** now includes weighting each visibility by its exposure time, and also improved in the way the *timebin* parameter is interpreted when its value is an integer.
- the **imsmooth** task has been made consistency with the rest of CASA in terms of masking
- **simobserve** now reads and populates antenna names rather than assigning numbers, which makes comparing simulated and real data easier.
- The *fldmap* parameter within the cal library will now support multiple fields
- CARTA v.1.3 with limited features is now available for users who wish to visualize their data outside the CASA Viewer.
- VLA P-band models have been made available in CASA for several standard calibrators.
- **Ephemeris tables for Solar System objects have been extended in time**

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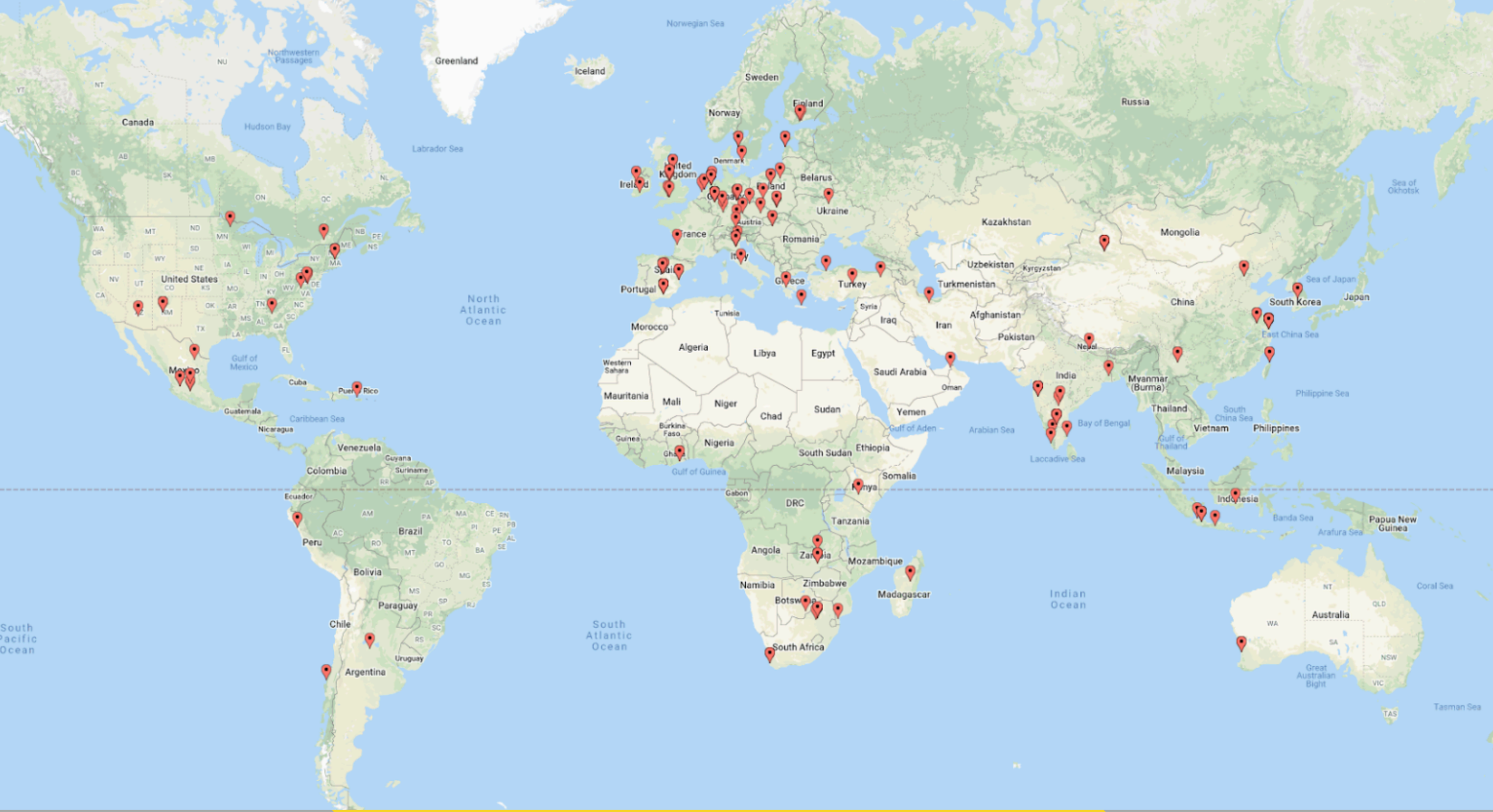
R&D / CASA VLBI work (future)

- Continued developments
  - funded through ESCAPE WorkPackage 3
  - novel wide- and widely separated band fringefit
  - full gaincurve support
    - import from FITS file
    - when joining MeasurementSets
    - .. splitting MeasurementSets
  - Adjust EOP parameters / model

R&D / CASA VLBI w

- Organized by JIVE
  - 2 Nov 2020 – 5 Nov 2020
- Due to COVID-19 strictly virtual event :-(
  - 12 tutors and ~ 200 participants (thanks to virtual event!)
    - i.e. **HUGE** interest in CASA VLBI!!
    - *many* more people can join than originally planned (<= 50)
  - Lectures through Zoom and YouTube live stream
  - Recordings will remain available after the workshop
- Use EVN Mattermost collaboration server
  - off-line discussions, questions
  - Contact with tutors


Norwegian Sea
Greenland
Iceland
Sweden
Norway
Finland
Russia
Canada
Hudson Bay
Labrador Sea
Northwestern Passages
Belarus
Ukraine
Kazakhstan
Mongolia
Sea of Okhotsk
Romania
Uzbekistan
Kyrgyzstan
Turkmenistan
Sea of Japan
China
South Korea
Japan
East China Sea
Portugal
Turkey
Syria
Iraq
Iran
Afghanistan
Pakistan
Nepal
India
Myanmar (Burma)
Thailand
Vietnam
Philippines
Philippine Sea
South China Sea
Gulf of Thailand
Laccadive Sea
Bay of Bengal
Arabian Sea
Malaysia
Indonesia
Banda Sea
Arafura Sea
Papua New Guinea
Coral Sea
Tasman Sea
Australia
Great Australian Bight
Tunisia
Morocco
Algeria
Libya
Egypt
Western Sahara
Mauritania
Mali
Niger
Chad
Sudan
Saudi Arabia
Oman
Yemen
Gulf of Aden
Nigeria
South Sudan
Ethiopia
Somalia
Gulf of Guinea
Gabon
DRC
Tanzania
Angola
Mozambique
Namibia
Zimbabwe
Madagascar
South Africa
North Atlantic Ocean
South Atlantic Ocean
Indian Ocean
United States
Gulf of Mexico
Cuba
Puerto Rico
Caribbean Sea
Guatemala
Nicaragua
Venezuela
Guyana
Suriname
Colombia
Ecuador
Peru
Brazil
Bolivia
Paraguay
Chile
Uruguay
Argentina
South Pacific Ocean

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R&D / Virtual Observatory

- Continued developments
  - funded through ESCAPE WorkPackage 4
  - make EVN data accessible through VO protocols
    - prototype ObsTAP(*) service on small # EVN archive experiments
    - being migrated from Mark's laptop to actual server
  - International VO Alliance Radio Interest Group
    - ObsCore standard does not usefully support visibility data yet
    - experiments at ASTRON/JIVE to update standards
    - characterisation of u,v plane for assessing scientific usefulness of data

(*) ObsCore (Observation Core data) Table Access Protocol

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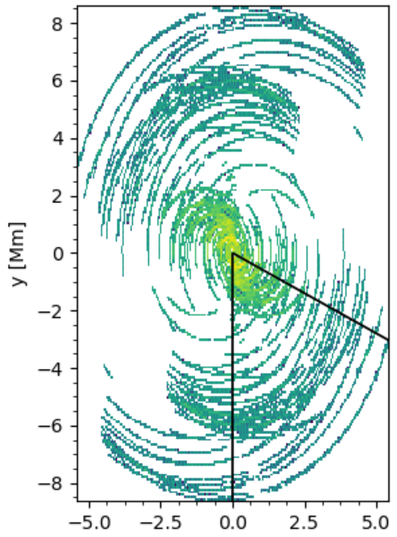
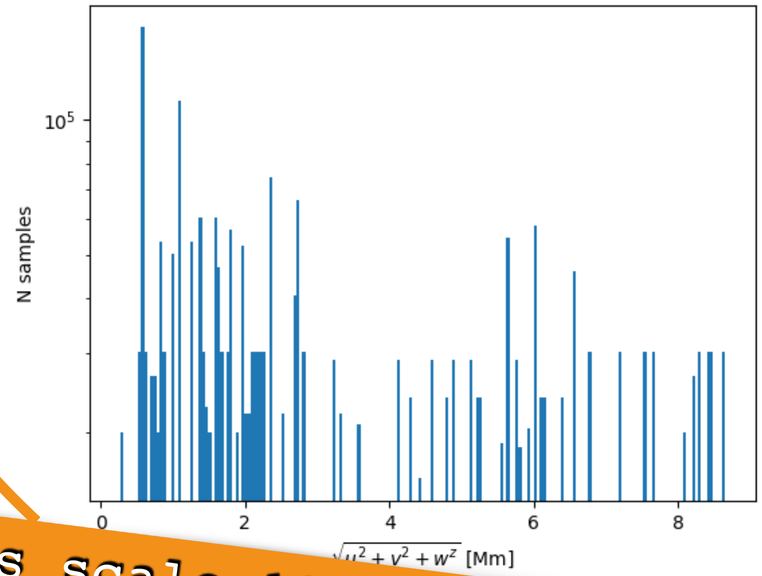
(*) ObsCore (Observation Core data) Table Access Protocol

u,v coverage

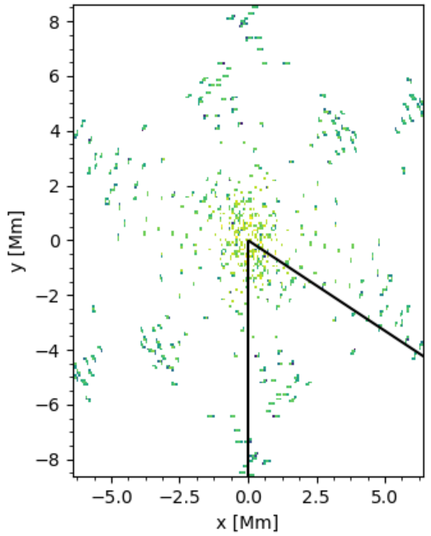
Histogram of #baselines per u,v distance

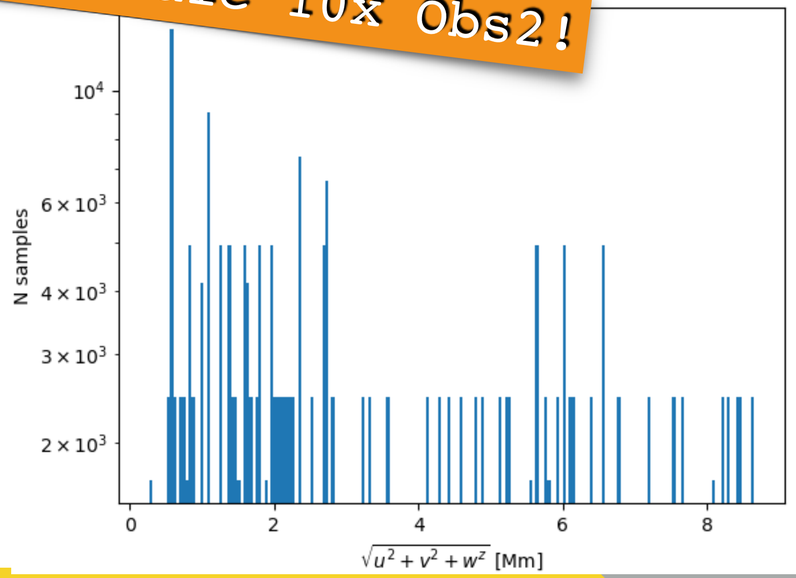
Obs1



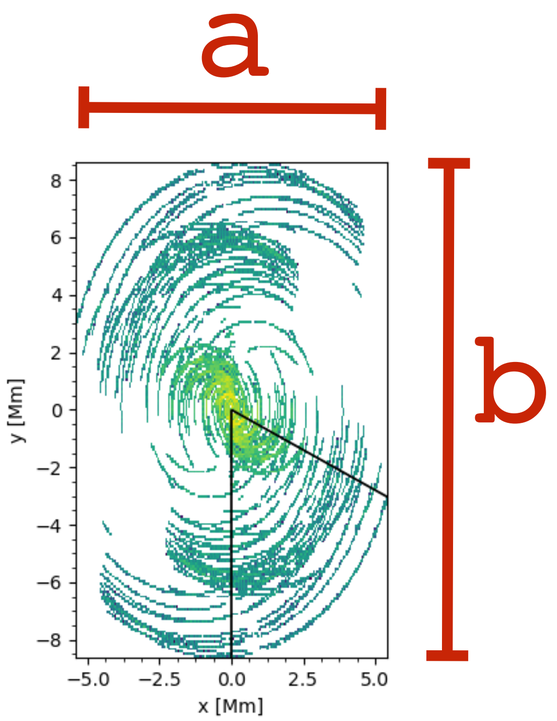


Obs2





Note: y-axis scale 10x Obs2!

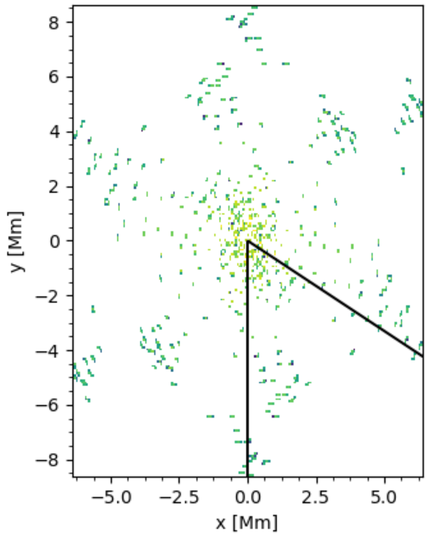


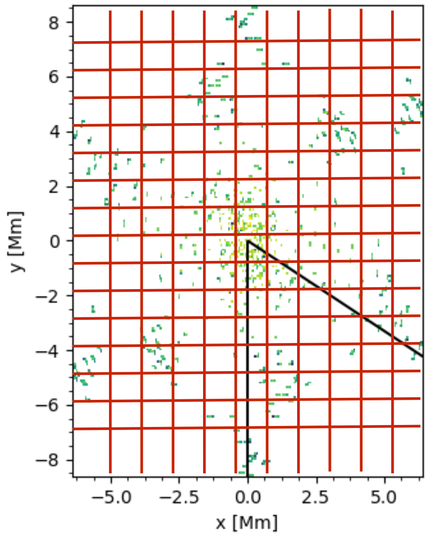
$$e = \frac{\min(a, b)}{\max(a, b)}$$

$e \sim 0 \implies$ asymmetric synthesized beam

$\implies$ bad for imaging

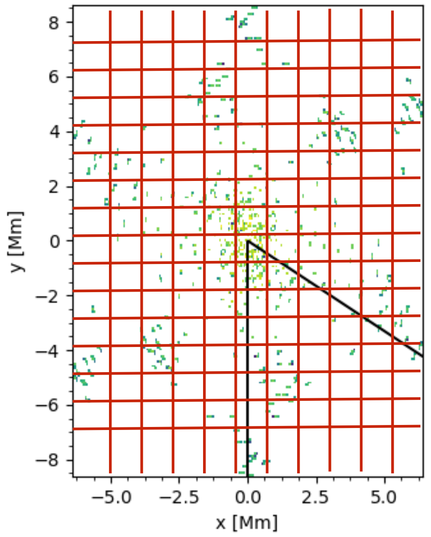
$e \sim 1 \implies$ good for imaging


8
6
4
2
0
−2
−4
−6
−8
y [Mm]
−5.0
−2.5
0.0
2.5
5.0
x [Mm]



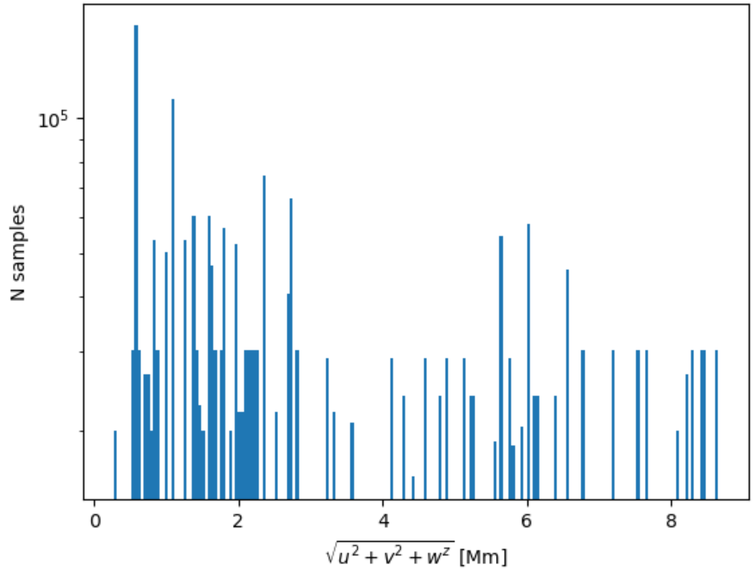
N_v

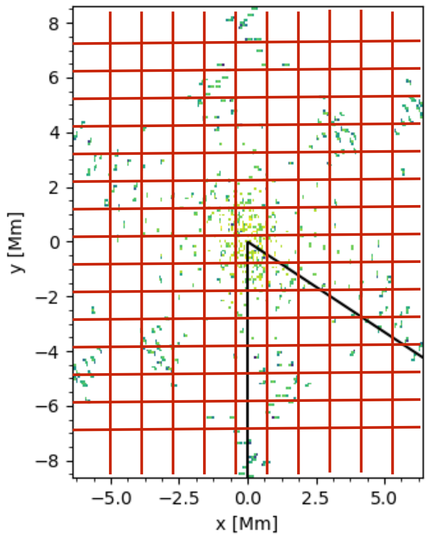
N_u


8
6
4
2
0
−2
−4
−6
−8
y [Mm]
−5.0
−2.5
0.0
2.5
5.0
x [Mm]

N_v

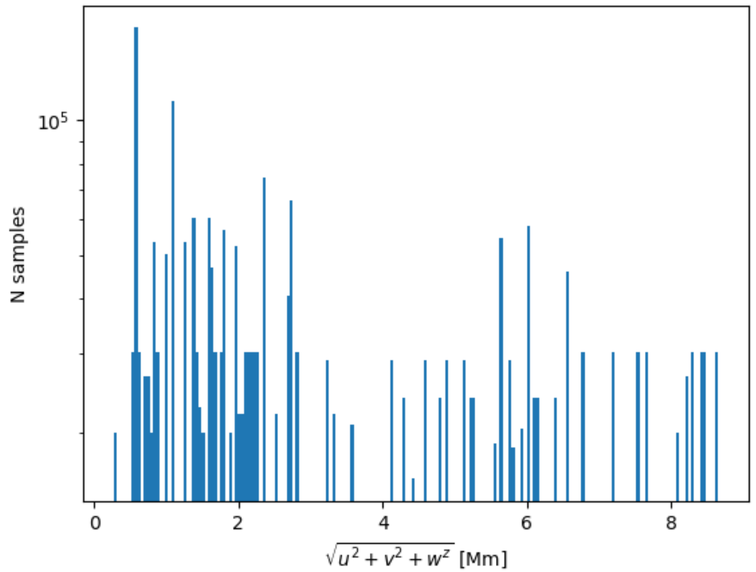
N_u


10^5
N samples
0
2
4
6
8
$\sqrt{u^2+v^2+w^2}$ [Mm]



N_v

N_u



define filling factor $\bar{f} = \dfrac{\Sigma_{u,v}\left(f(u,v)\cdot dudv\right)}{N_u \cdot N_v}$

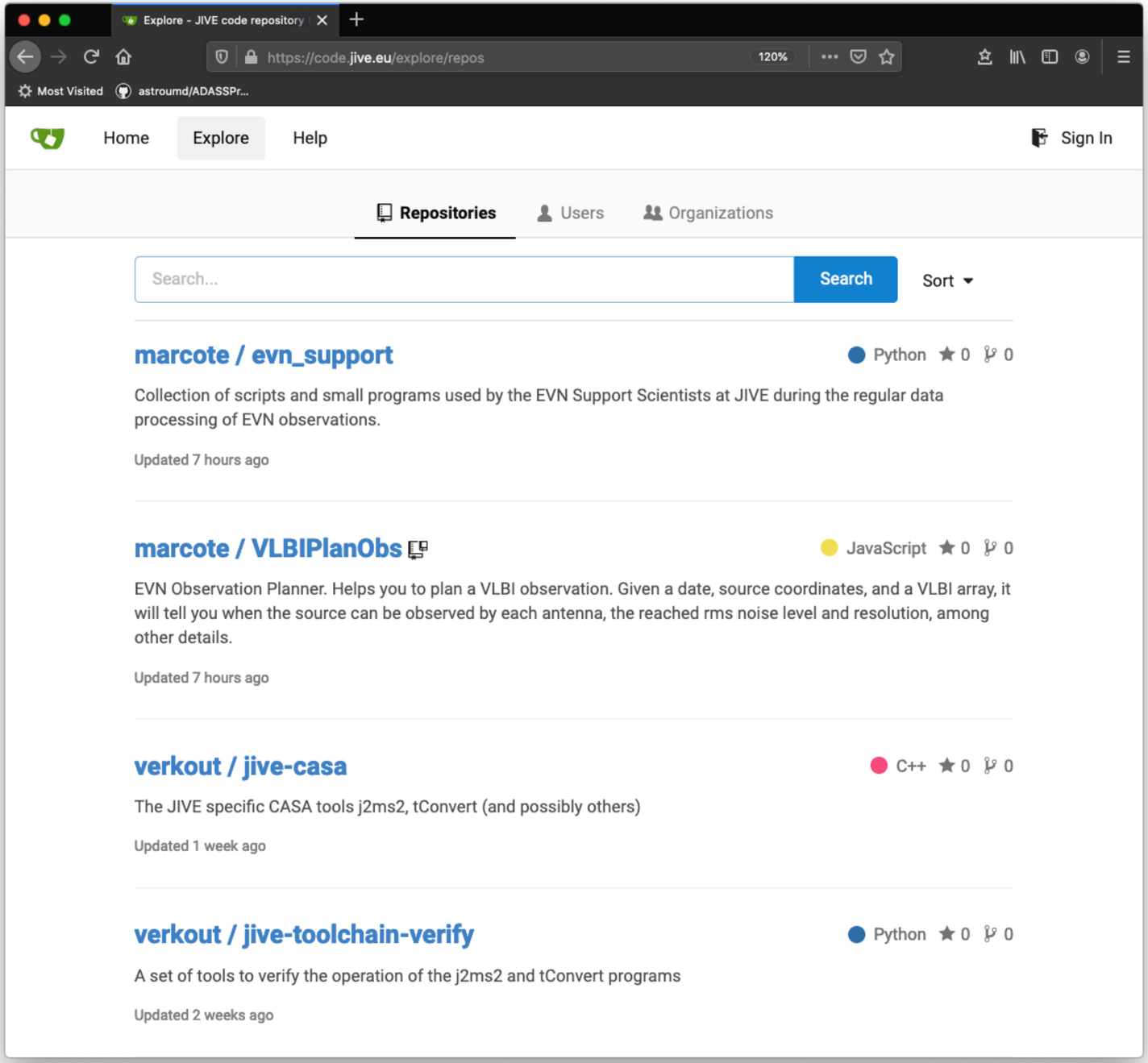
large $\bar{f} \Longrightarrow$ well sampled u,v plane

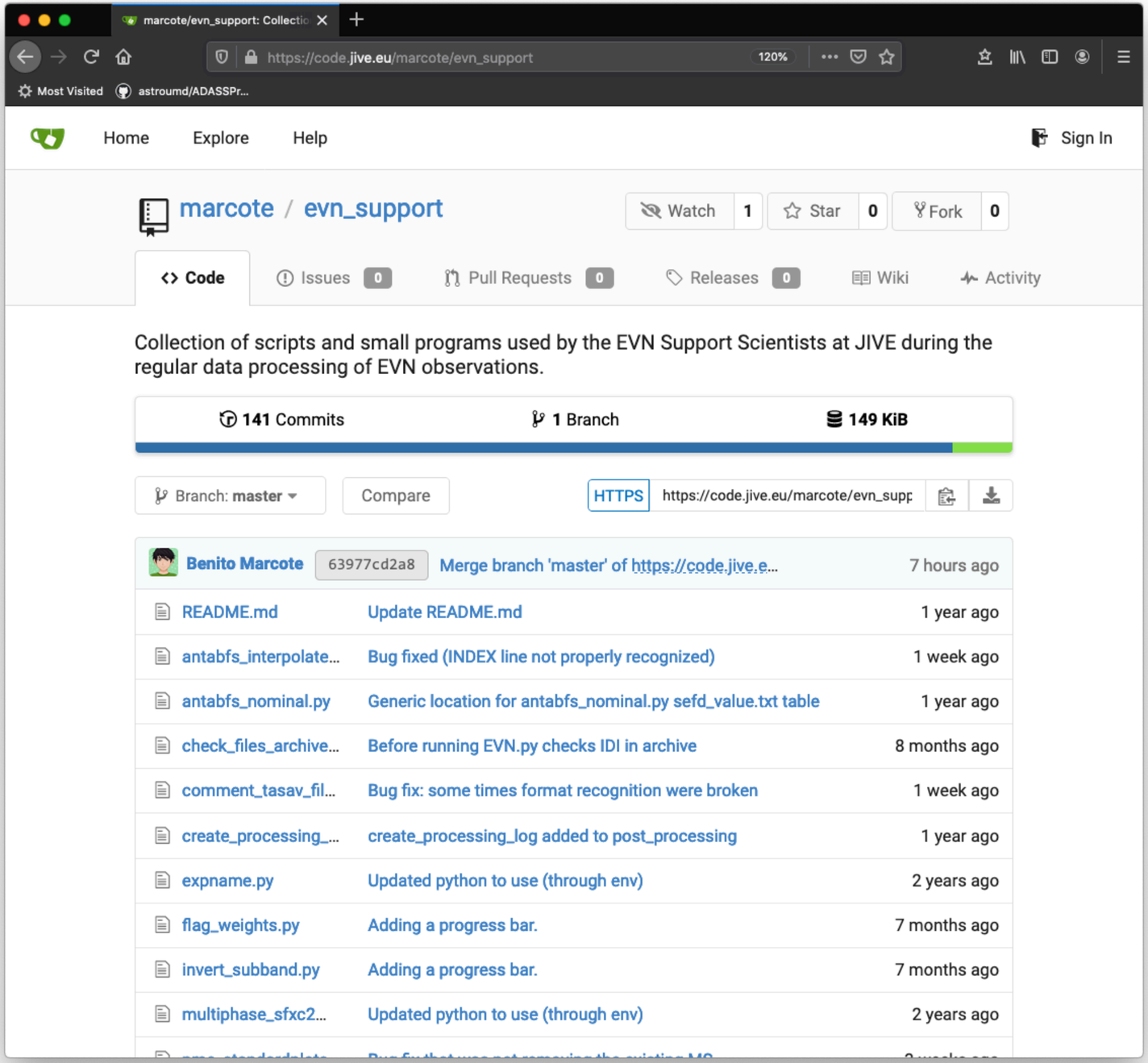
small $\bar{f} \Longrightarrow$ "empty" u,v plane
$\Longrightarrow$ bad for sensitivity

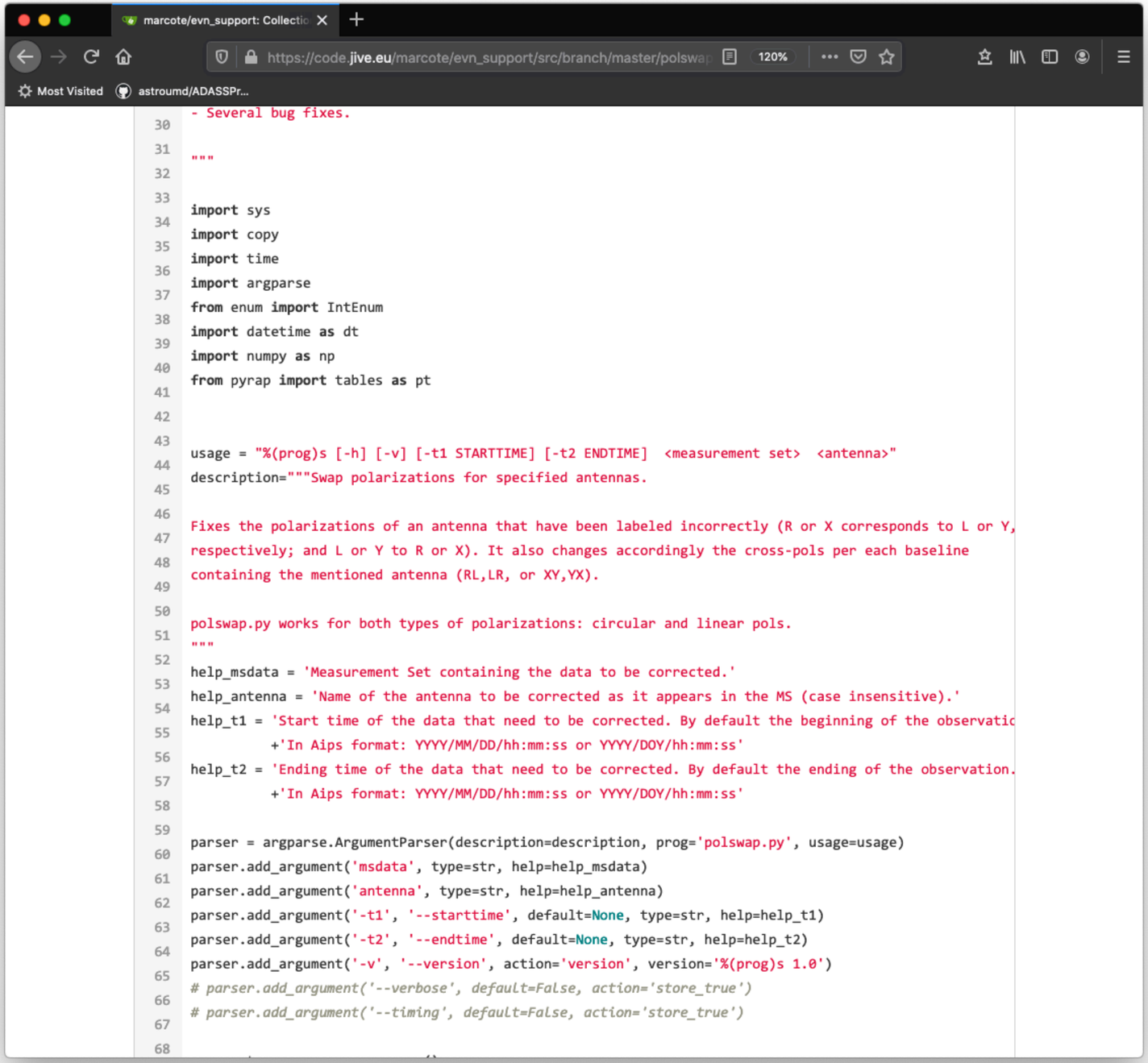
JIVE code repository (gitea)
https://code.jive.eu
120%
Most Visited
astroumd/ADASSPr...
Home
Explore
Help
Sign In
JIVE
Joint Institute for VLBI
ERIC
JIVE code repository (gitea)
Press Explore to view the public repositories
Powered by Gitea Version: 1.12.3 Page: 4ms Template: 4ms
English
JavaScript licenses
API
Website
Go1.14.6

R&D / self-hosted *“github”*

https://code.jive.eu


Explore - JIVE code repository
https://code.jive.eu/explore/repos
120%
Most Visited
astroumd/ADASSPr...
Home
Explore
Help
Sign In
Repositories
Users
Organizations
Search...
Search
Sort
marcote / evn_support
Python 0 0
Collection of scripts and small programs used by the EVN Support Scientists at JIVE during the regular data processing of EVN observations.
Updated 7 hours ago
marcote / VLBIPlanObs
JavaScript 0 0
EVN Observation Planner. Helps you to plan a VLBI observation. Given a date, source coordinates, and a VLBI array, it will tell you when the source can be observed by each antenna, the reached rms noise level and resolution, among other details.
Updated 7 hours ago
verkout / jive-casa
C++ 0 0
The JIVE specific CASA tools j2ms2, tConvert (and possibly others)
Updated 1 week ago
verkout / jive-toolchain-verify
Python 0 0
A set of tools to verify the operation of the j2ms2 and tConvert programs
Updated 2 weeks ago


marcote/evn_support: Collectio
https://code.jive.eu/marcote/evn_support
120%
Most Visited
astroumd/ADASSPr...
Home
Explore
Help
Sign In
marcote / evn_support
Watch 1
Star 0
Fork 0
Code
Issues 0
Pull Requests 0
Releases 0
Wiki
Activity
Collection of scripts and small programs used by the EVN Support Scientists at JIVE during the regular data processing of EVN observations.
141 Commits
1 Branch
149 KiB
Branch: master
Compare
HTTPS
https://code.jive.eu/marcote/evn_supp
Benito Marcote
63977cd2a8
Merge branch 'master' of https://code.jive.e...
7 hours ago
README.md
Update README.md
1 year ago
antabfs_interpolate...
Bug fixed (INDEX line not properly recognized)
1 week ago
antabfs_nominal.py
Generic location for antabfs_nominal.py sefd_value.txt table
1 year ago
check_files_archive...
Before running EVN.py checks IDI in archive
8 months ago
comment_tasav_fil...
Bug fix: some times format recognition were broken
1 week ago
create_processing_...
create_processing_log added to post_processing
1 year ago
expname.py
Updated python to use (through env)
2 years ago
flag_weights.py
Adding a progress bar.
7 months ago
invert_subband.py
Adding a progress bar.
7 months ago
multiphase_sfxc2...
Updated python to use (through env)
2 years ago




```
- Several bug fixes.

"""

import sys
import copy
import time
import argparse
from enum import IntEnum
import datetime as dt
import numpy as np
from pyrap import tables as pt


usage = "%(prog)s [-h] [-v] [-t1 STARTTIME] [-t2 ENDTIME]  <measurement set>  <antenna>"
description="""Swap polarizations for specified antennas.

Fixes the polarizations of an antenna that have been labeled incorrectly (R or X corresponds to L or Y,
respectively; and L or Y to R or X). It also changes accordingly the cross-pols per each baseline
containing the mentioned antenna (RL,LR, or XY,YX).

polswap.py works for both types of polarizations: circular and linear pols.
"""
help_msdata = 'Measurement Set containing the data to be corrected.'
help_antenna = 'Name of the antenna to be corrected as it appears in the MS (case insensitive).'
help_t1 = 'Start time of the data that need to be corrected. By default the beginning of the observatic
          +'In Aips format: YYYY/MM/DD/hh:mm:ss or YYYY/DOY/hh:mm:ss'
help_t2 = 'Ending time of the data that need to be corrected. By default the ending of the observation.
          +'In Aips format: YYYY/MM/DD/hh:mm:ss or YYYY/DOY/hh:mm:ss'

parser = argparse.ArgumentParser(description=description, prog='polswap.py', usage=usage)
parser.add_argument('msdata', type=str, help=help_msdata)
parser.add_argument('antenna', type=str, help=help_antenna)
parser.add_argument('-t1', '--starttime', default=None, type=str, help=help_t1)
parser.add_argument('-t2', '--endtime', default=None, type=str, help=help_t2)
parser.add_argument('-v', '--version', action='version', version='%(prog)s 1.0')
# parser.add_argument('--verbose', default=False, action='store_true')
# parser.add_argument('--timing', default=False, action='store_true')
```

Thanks for attention!