Absolute Flux Calibration

Melanie Krips

by Arancha Castro-Carrizo

Outline

I. Primary/Secondary Flux Calibrators

II. Practical Tips to Calibrate the Fluxes of your Sources

Motivation

What do we want in a flux calibrator?

- strong (>1 Jy) emission at mm wavelengths
- compact (<< 1”) emission at mm wavelengths
- emission should not be variable in time
- preferentially with long LST range (i.e., high declination source)
- no or only little sun-avoidance
- preferentially well known properties (such as SED, size)

Flux Calibrators

1. Quasars
2. Planets
3. Solar Bodies (Satellites, Asteroids, Dwarf Planets)
4. Radio Stars
5. Antenna Efficiencies?

Flux Calibrators

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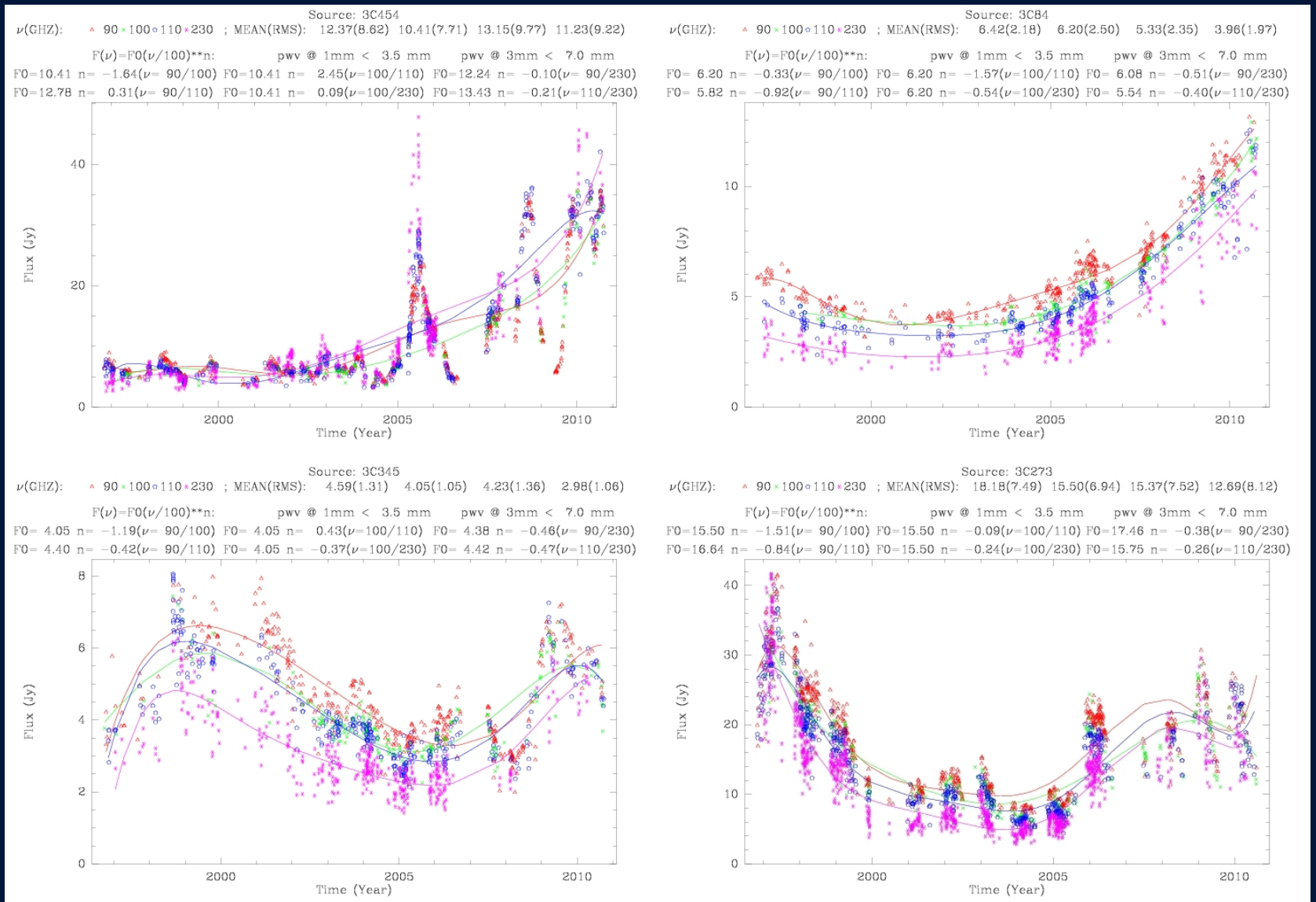
Flux Calibrators: Quasars



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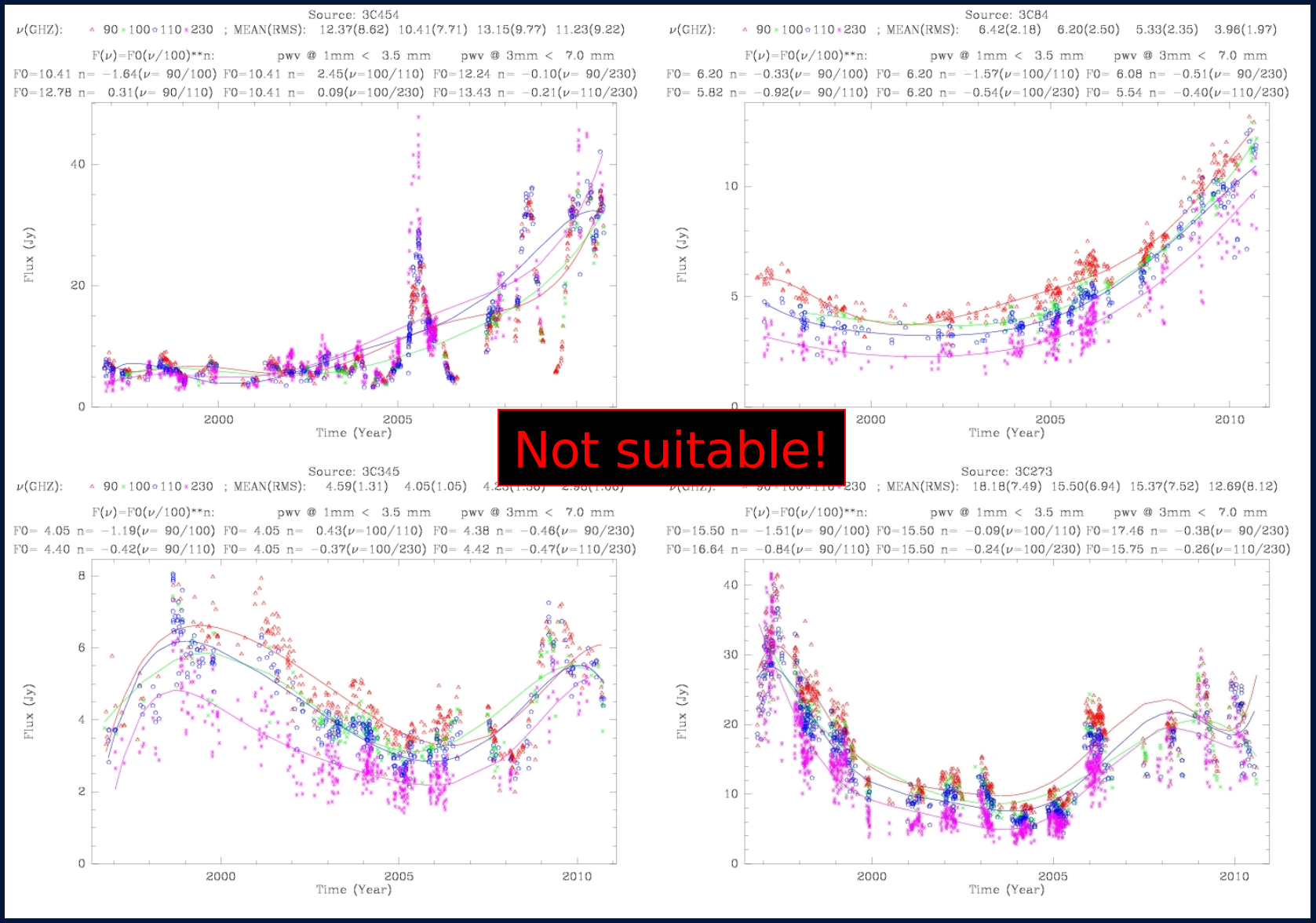

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Flux Calibrators: Planets

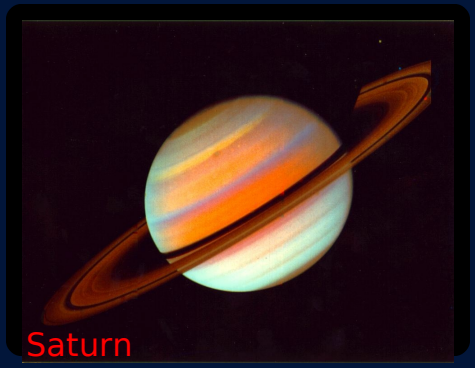
- Pro:
  most of the solar planets have strong mm-emission and reasonably well derived flux models

- Contra:
  1.) Fluxes not completely constant
  2.) They start to be resolved (≥ 3”) already at 3mm
  3.) Some of them have broad molecular line absorption (e.g., Mars, Jupiter, Saturn)
  4.) Not always visible, i.e., more constraints due to sun-avoidance, short LST ranges

Mars

Uranus

Jupiter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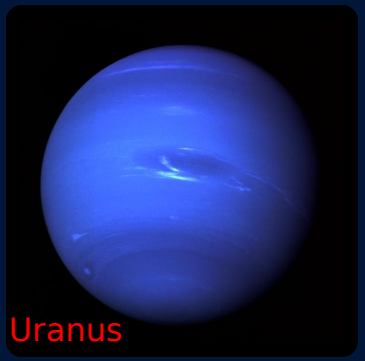
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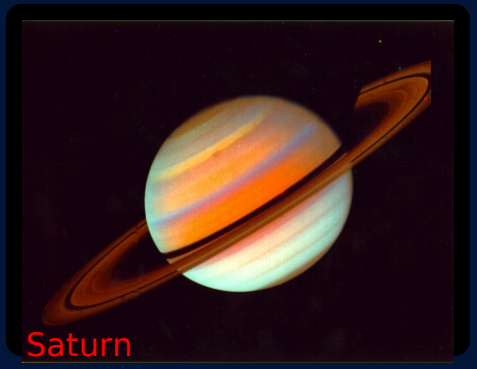
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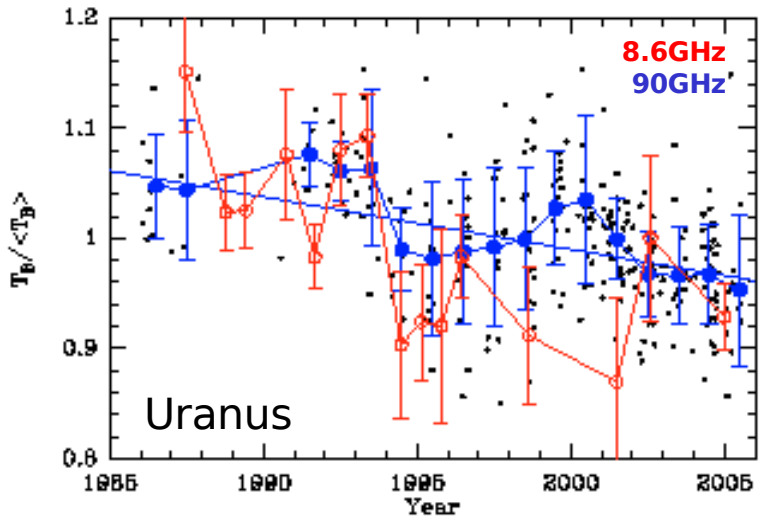
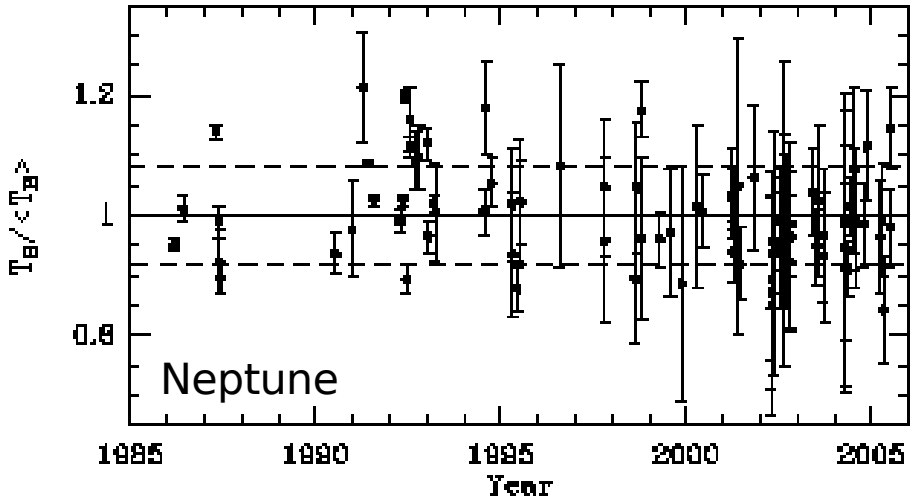
Kramer et al. (2008)





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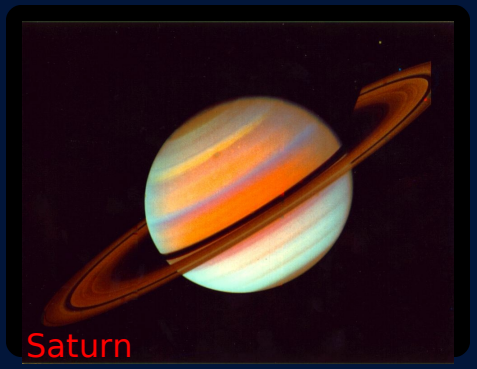

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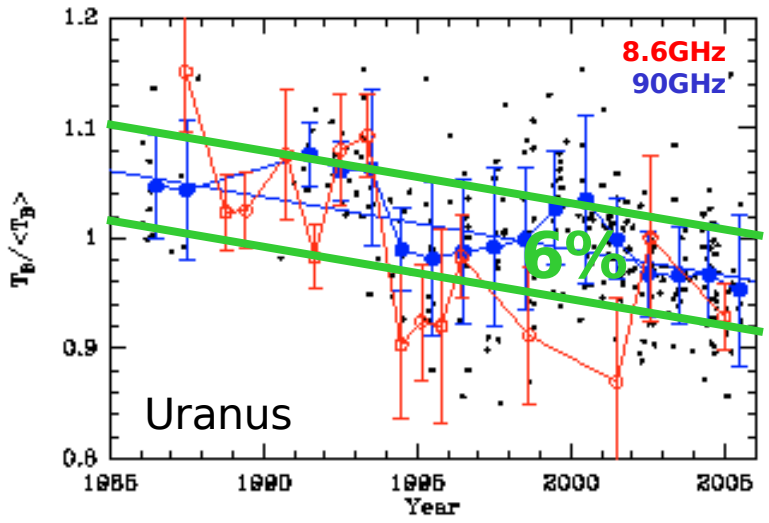

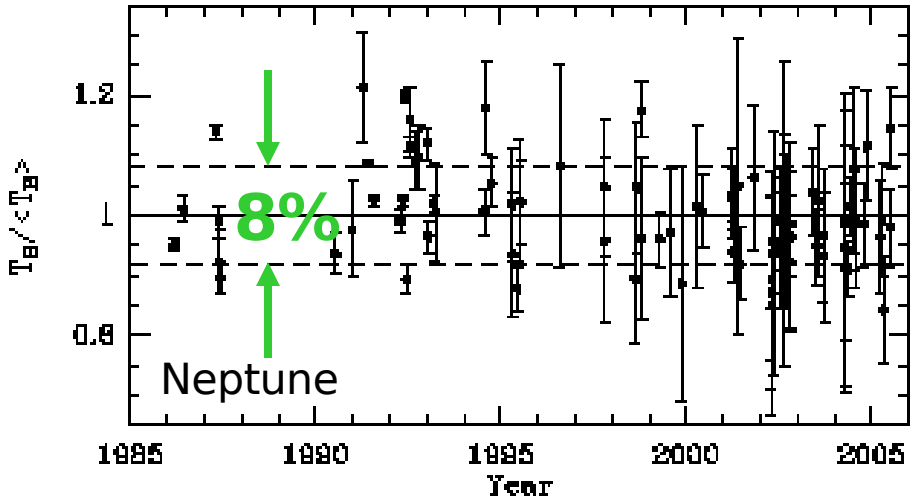

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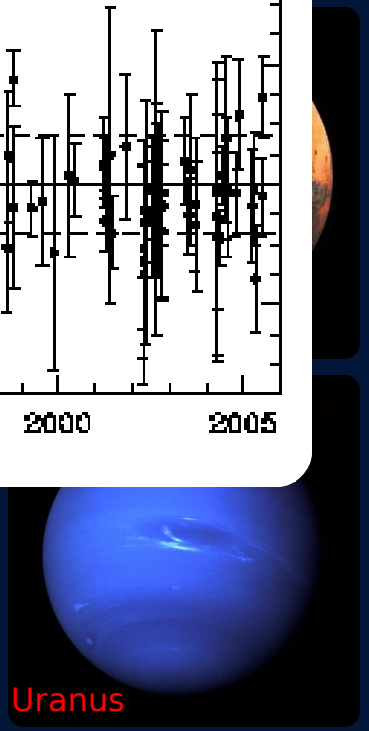

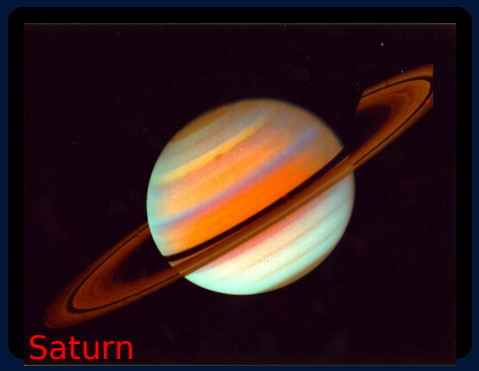

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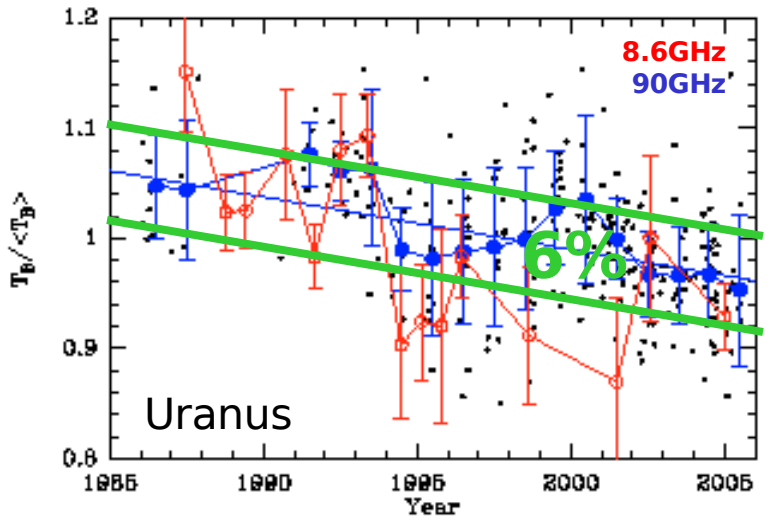

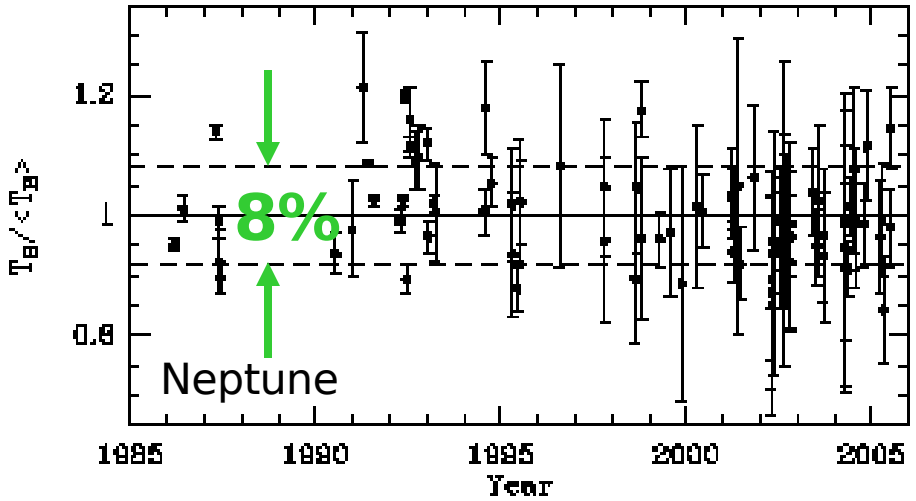

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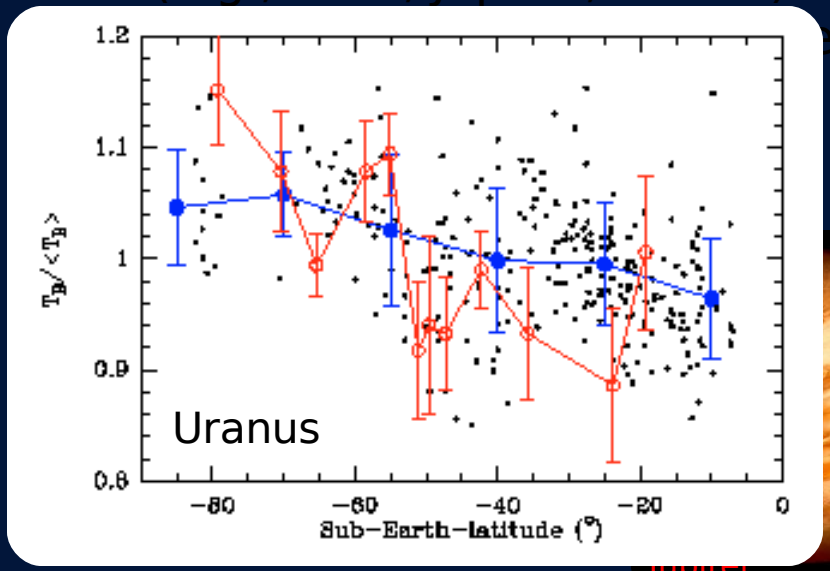

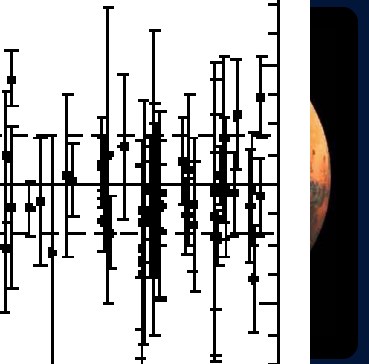

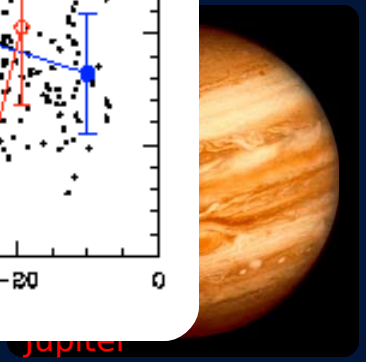

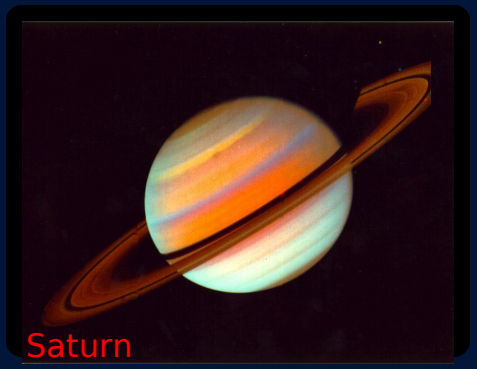

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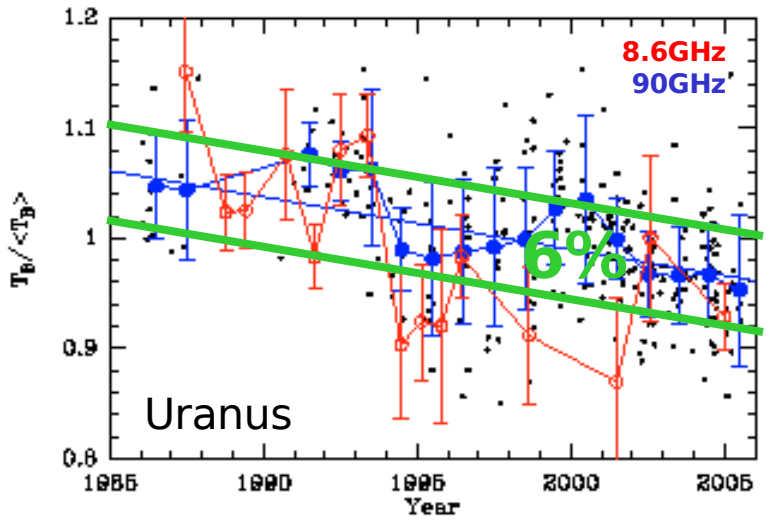

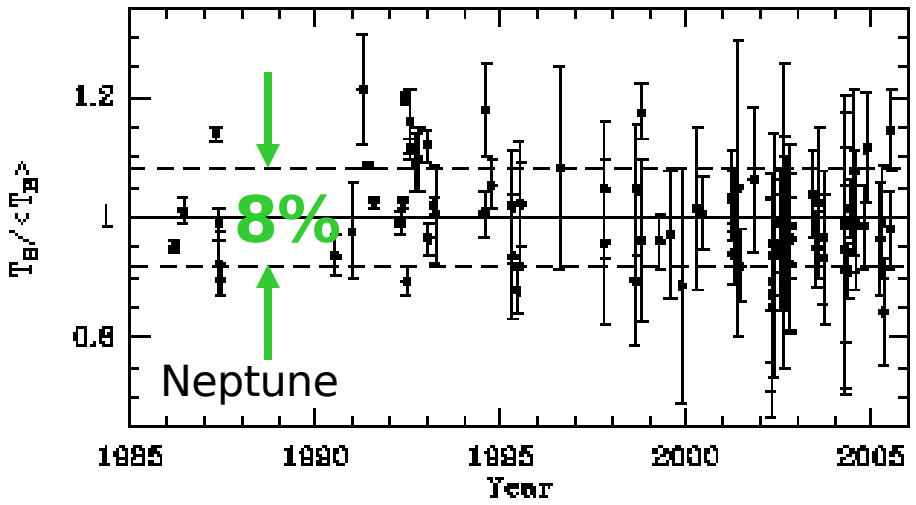

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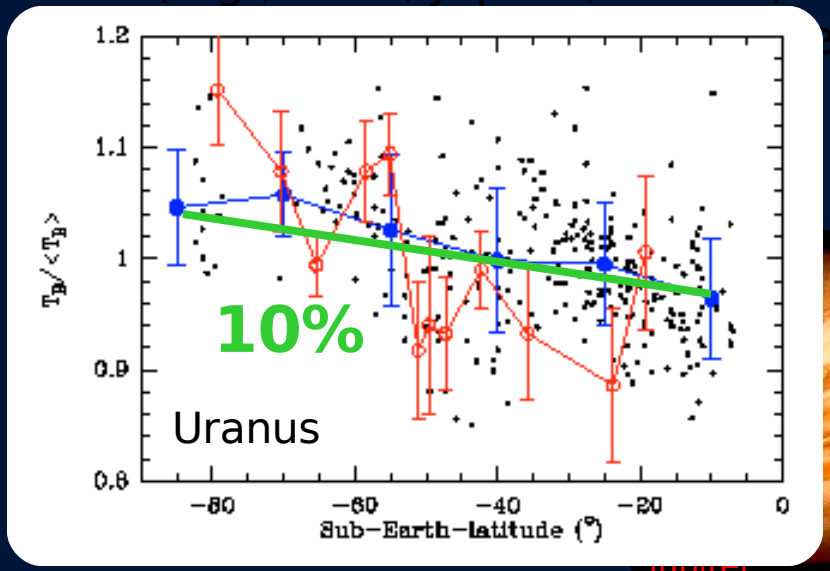

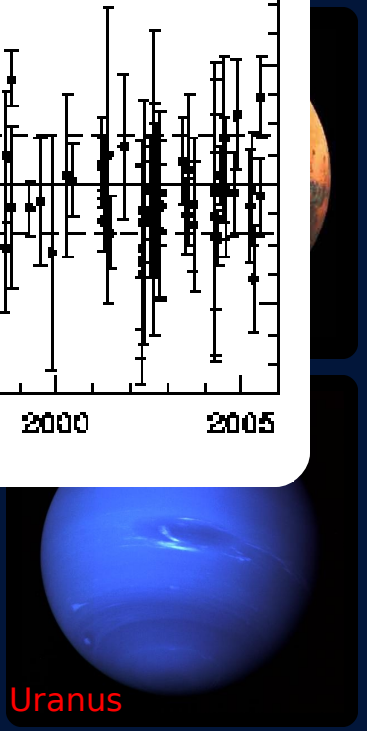

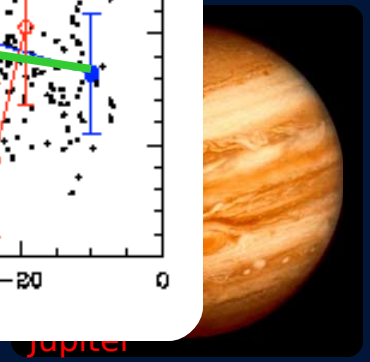

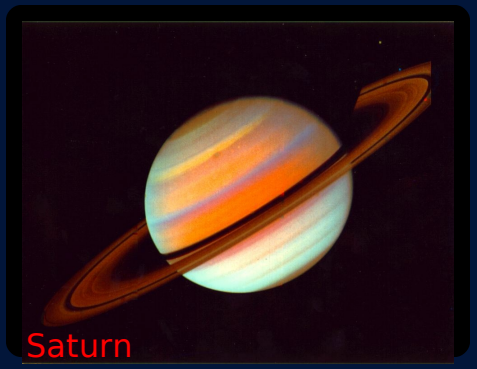

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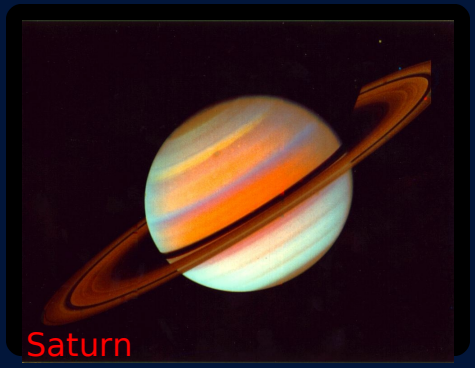
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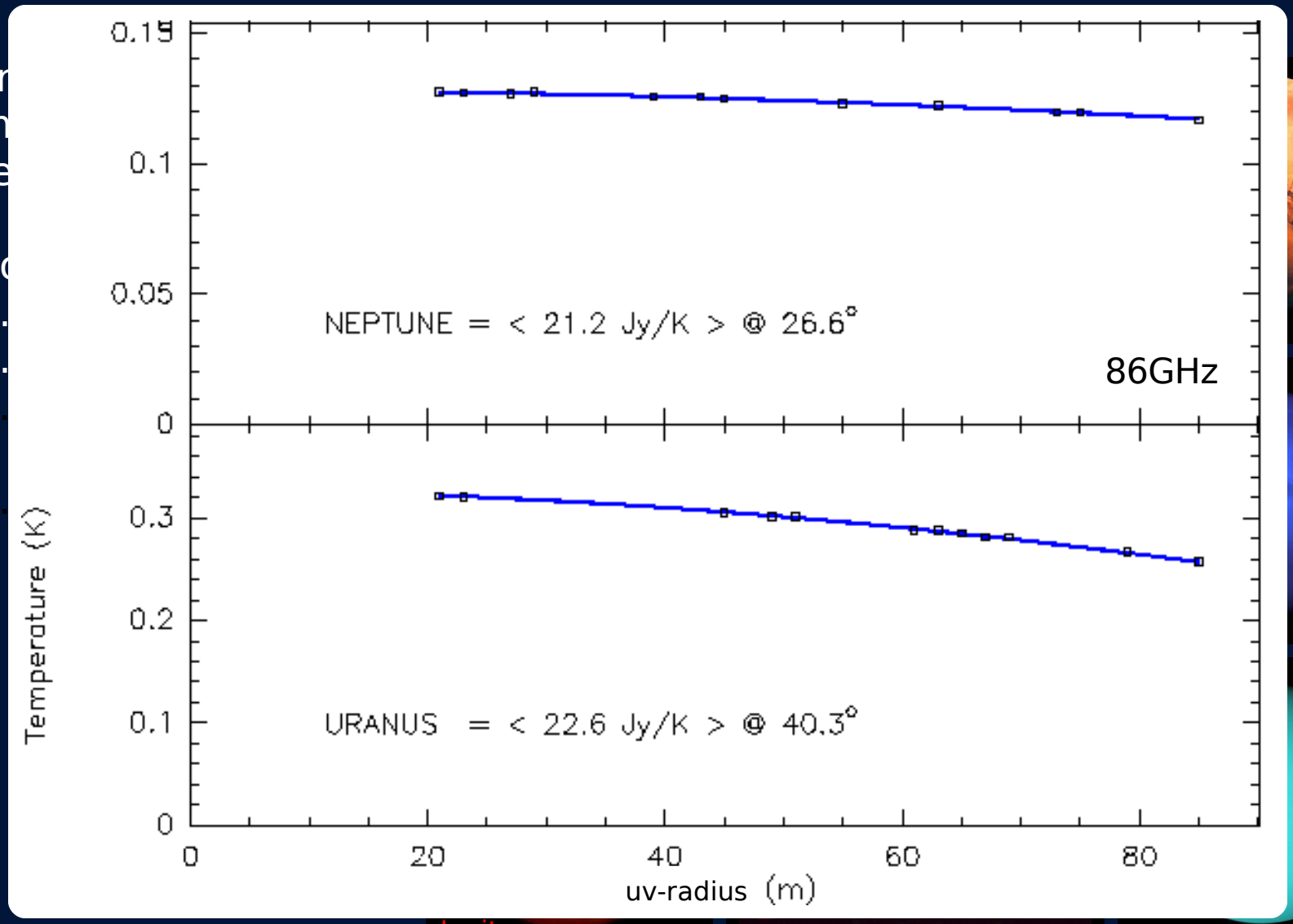

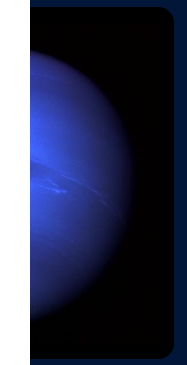

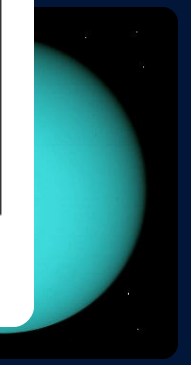

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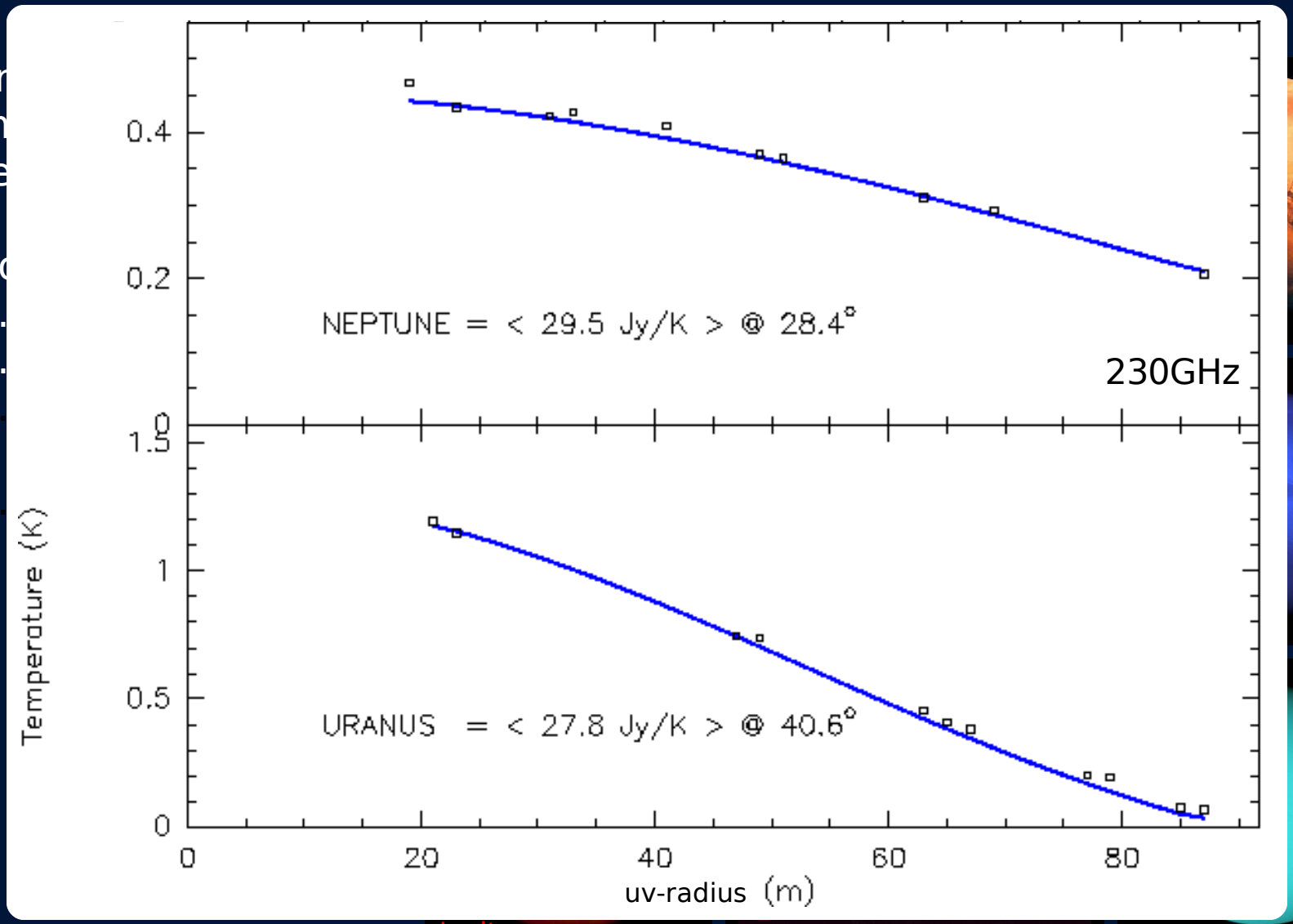

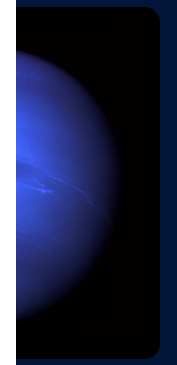

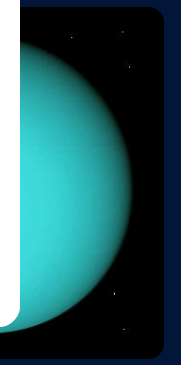

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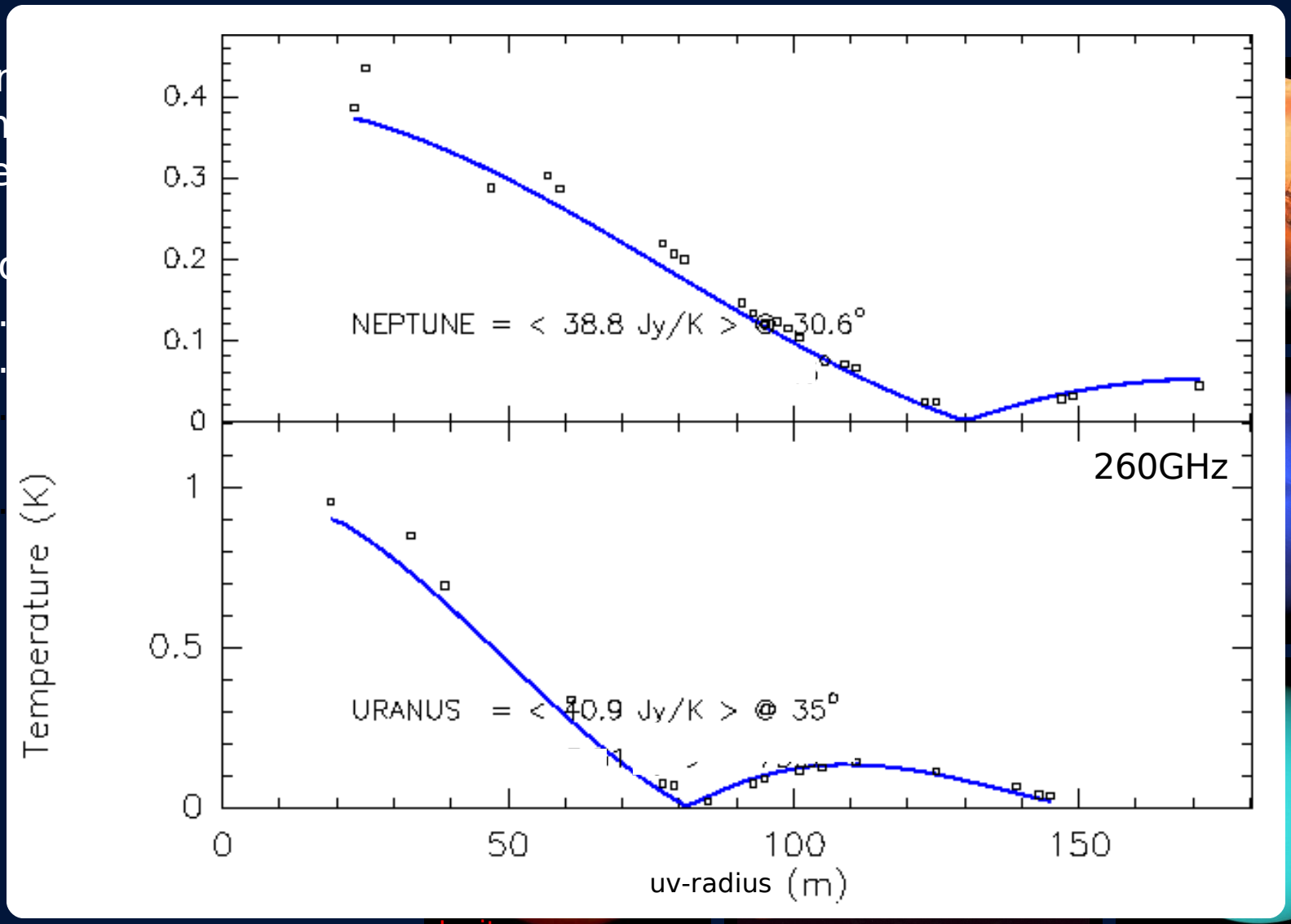

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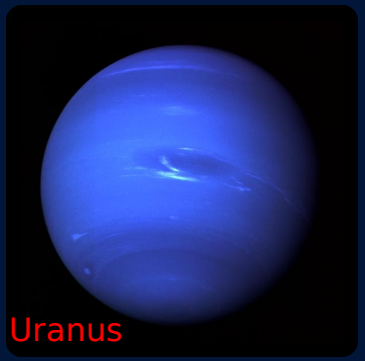
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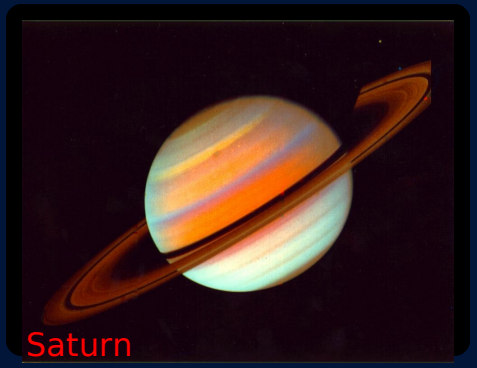
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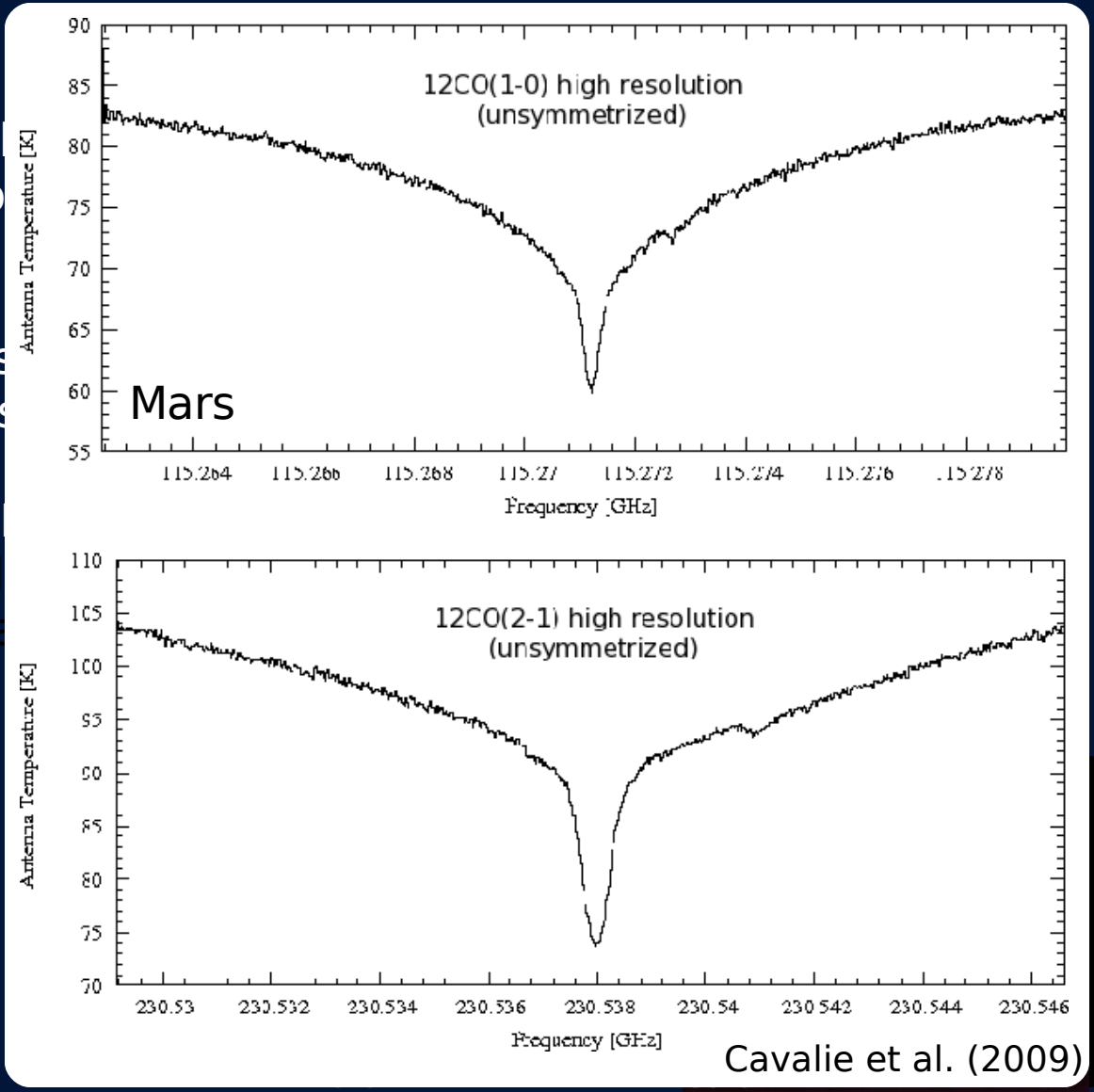

Cavalie et al. (2009)

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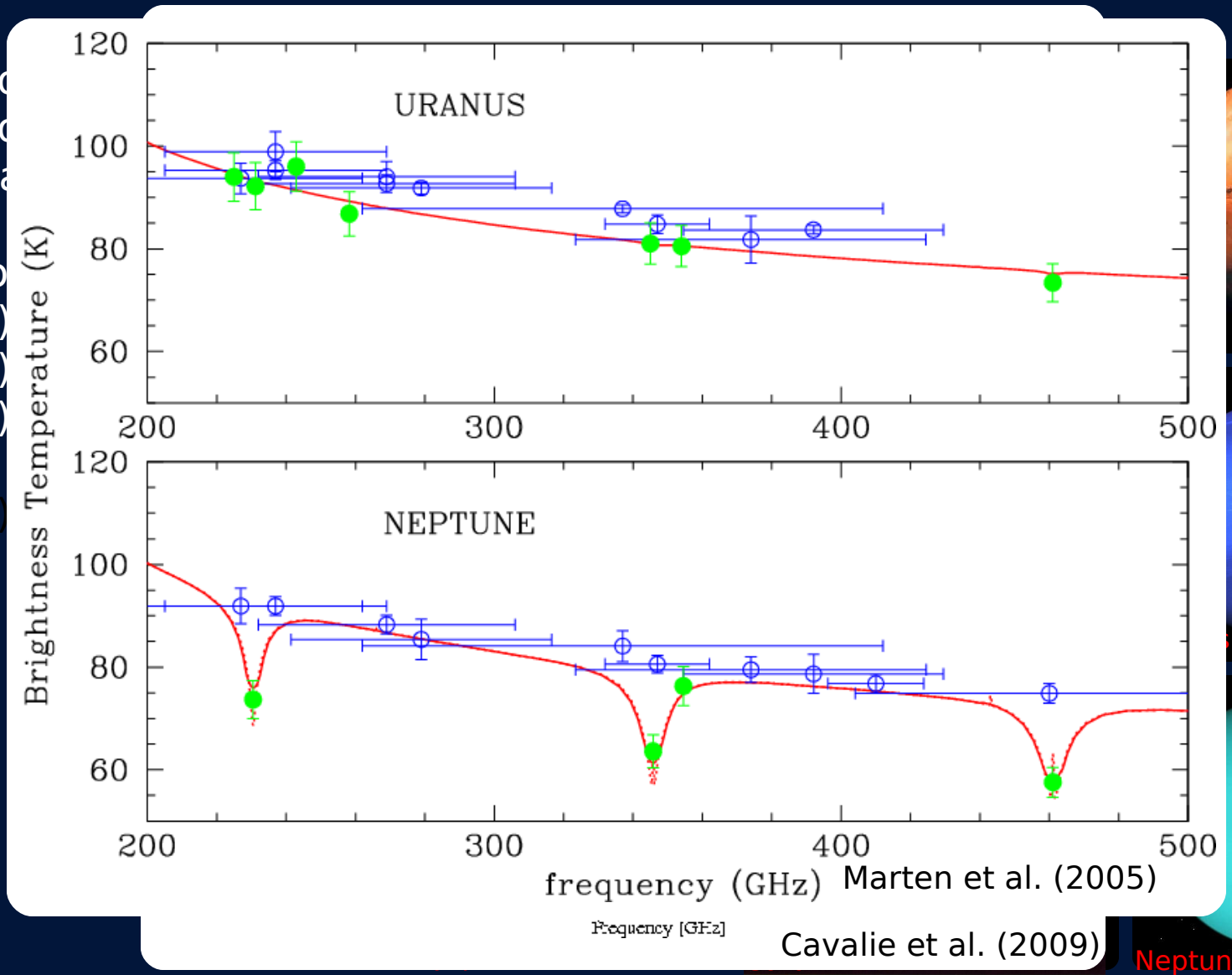

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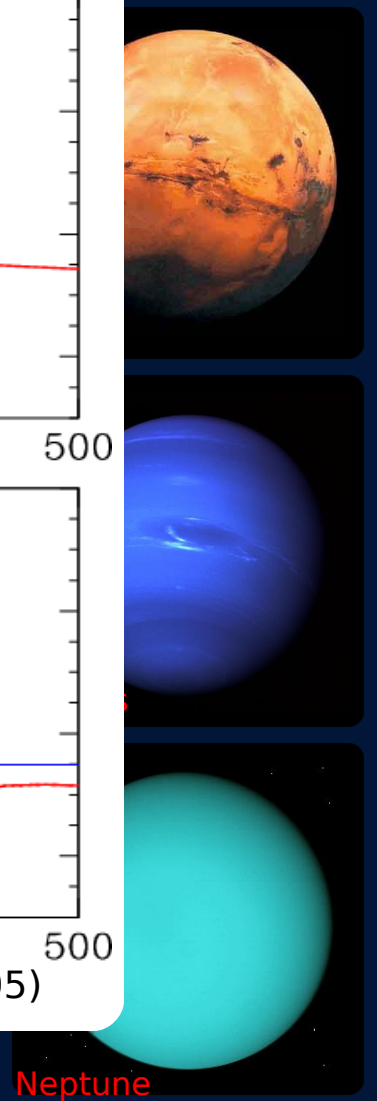

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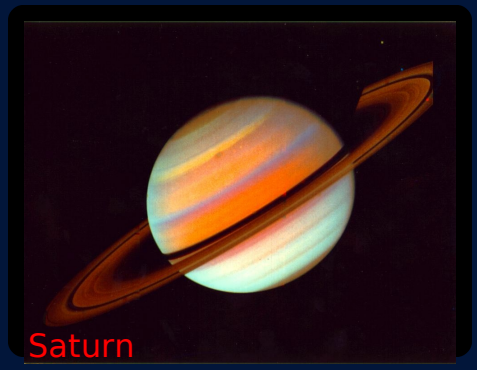
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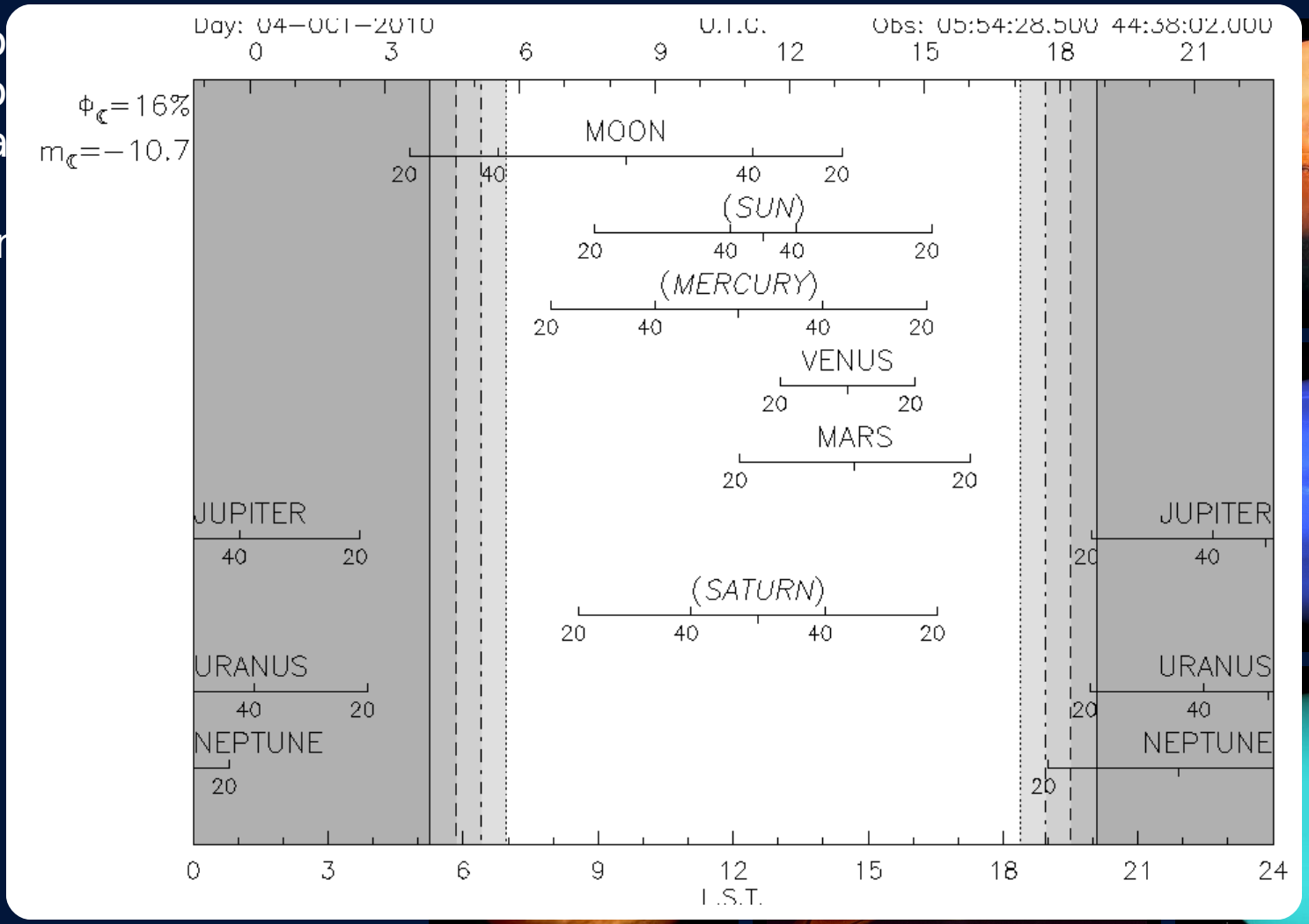

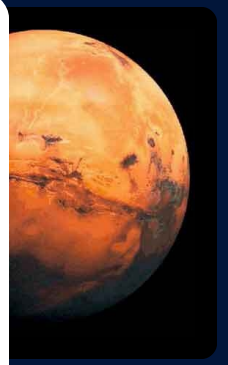

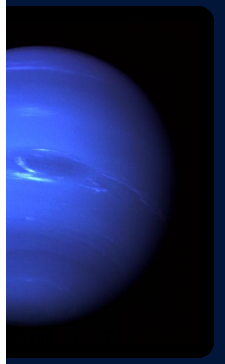

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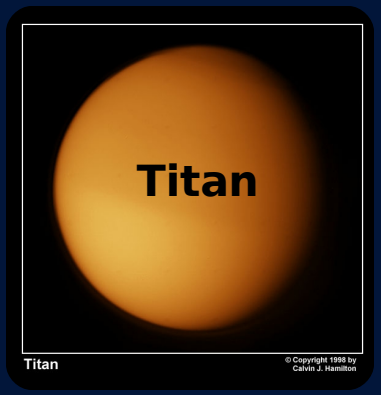
- Pro:
  - They are quite compact (hence better for extended configurations and/or higher frequencies than planets) and still sufficiently bright (>500mJy@3mm)

- Already regularly used at the SMA:
  Titan, Ganymede, Callisto

- Contra:
  - Titan also shows broad molecular lines
  - they are not always useable especially when they are too close to their ‘mother’-planet (or each other); one needs at least 3xPB
  - flux models not as well constrained as for planets



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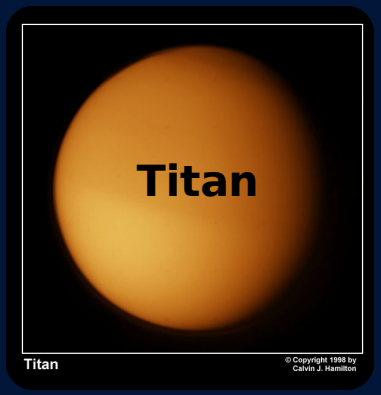

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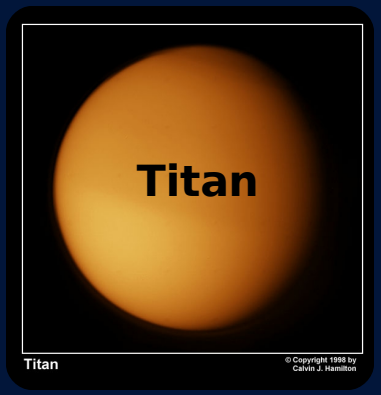

Flux Calibrators: Asteroids/Dwarf Planets

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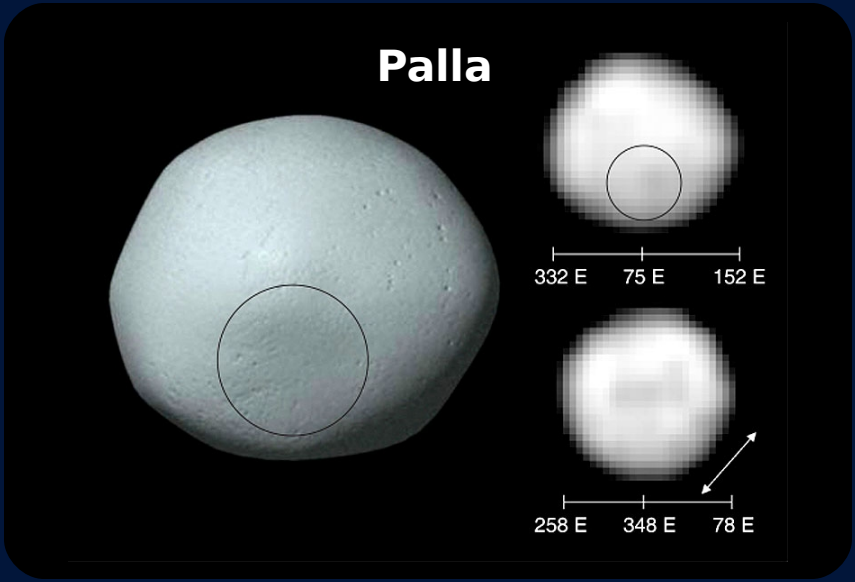
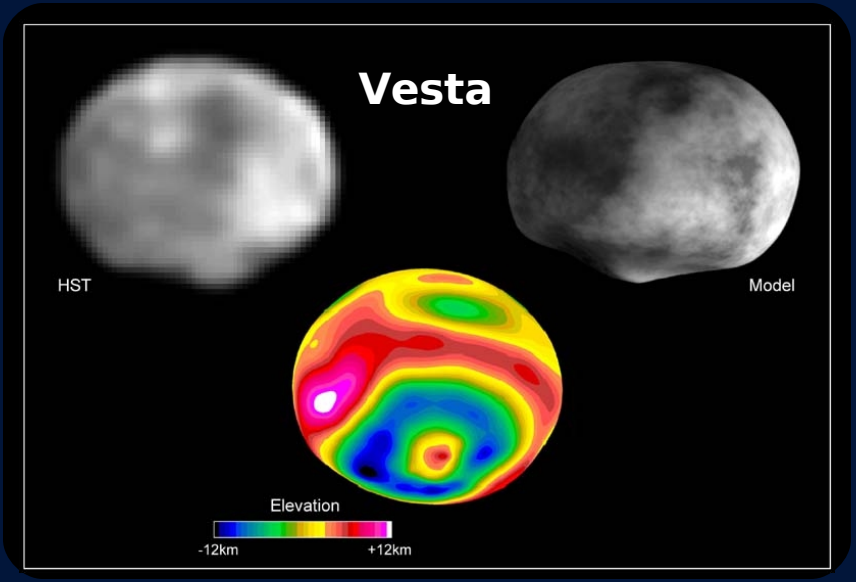
  - bright and relatively small solar bodies

- Contra:
  - Fluxes not (yet) well determined; some of them known to vary quite significantly within a day
  - irregular shapes





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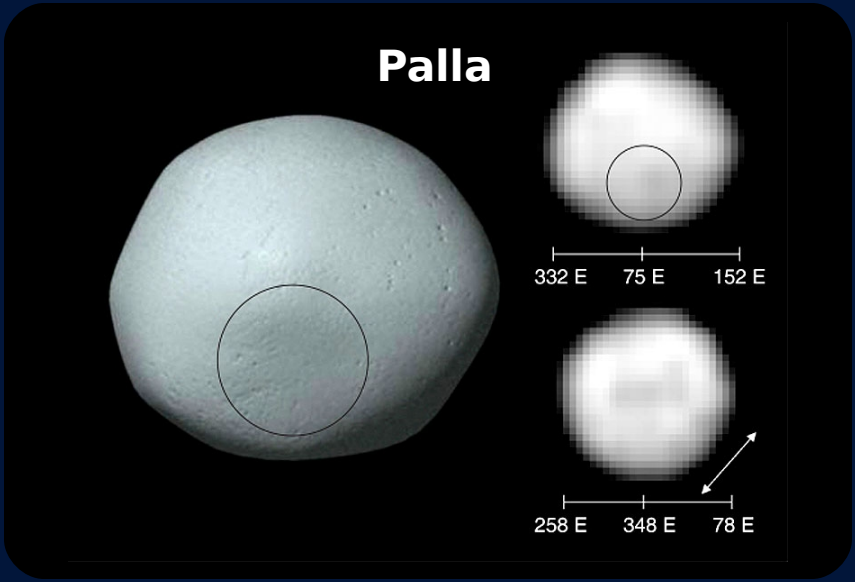

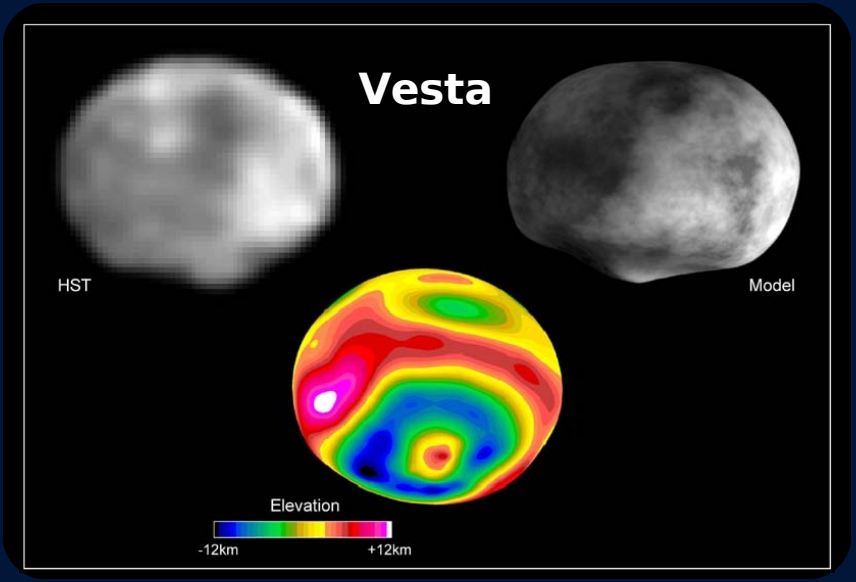

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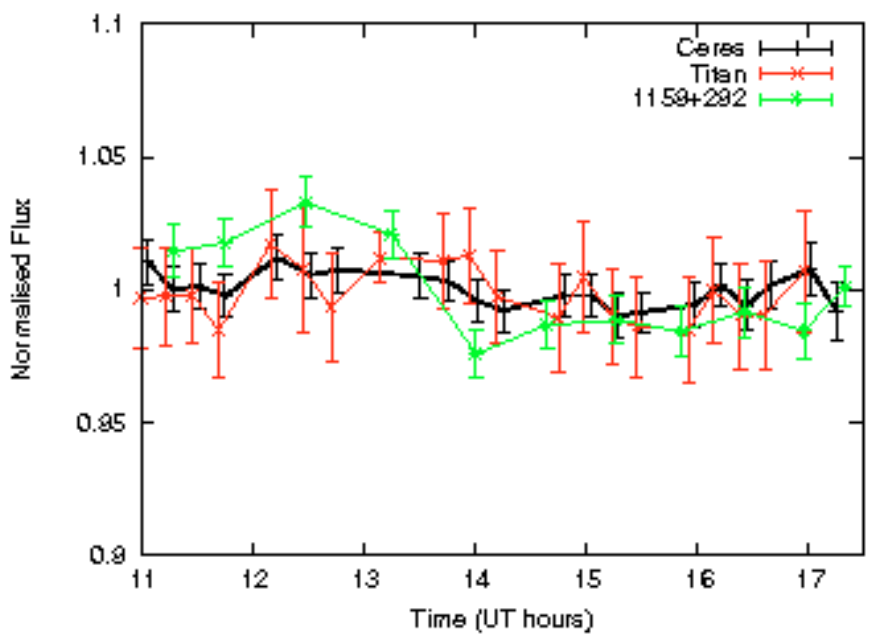
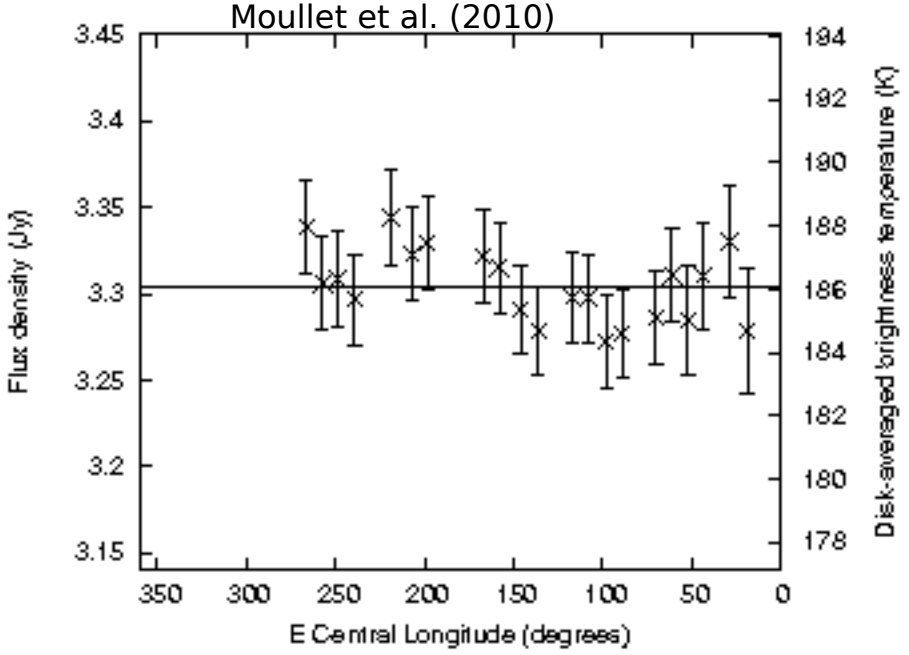
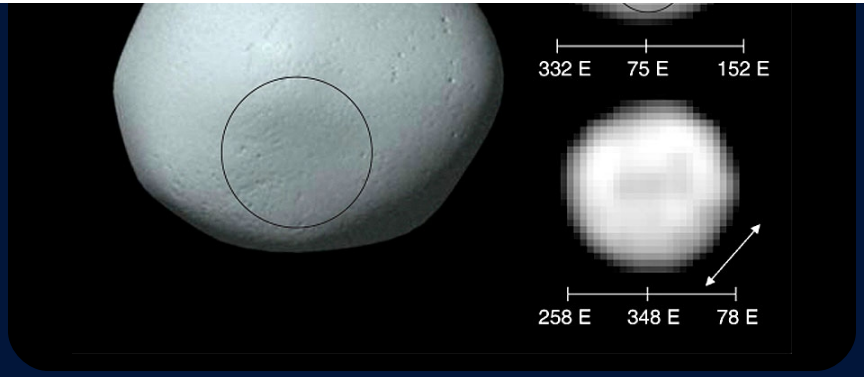
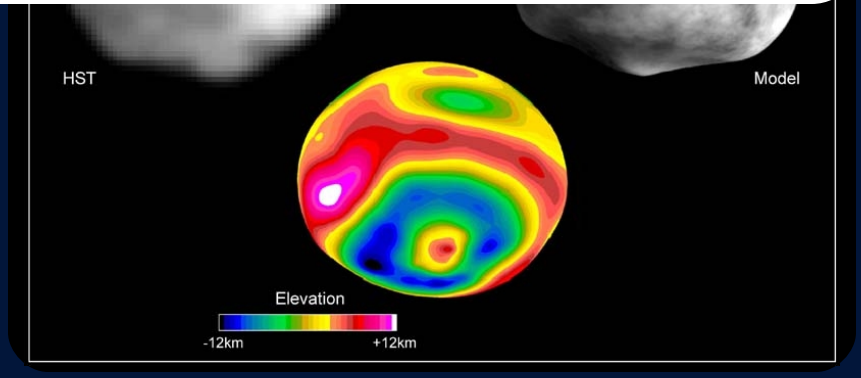


Moullet et al. (2010)







Flux Calibrators

1. Quasars
2. Planets
3. Solar Bodies (Satellites, Asteroids, Dwarf Planets)
4. Radio Stars

1. Antenna Efficiencies?

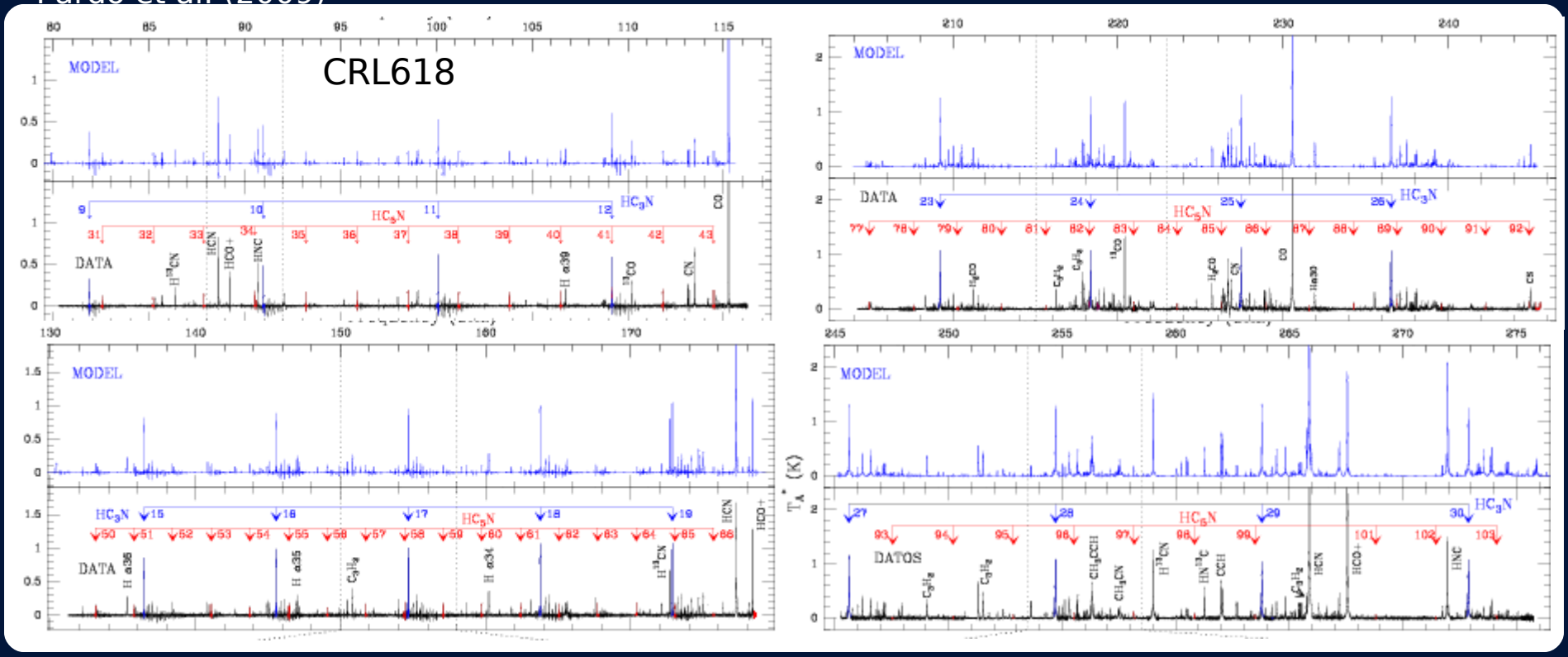
Flux Calibrators: Radio Stars

Number of radio bright stars:

- MWC349 (binary star)
- CRL618 (PPN)
- W3OH (HII region)
- NGC7072 (young PN)
- NGC7538 (HII region)
- K3-50A (HII-region)
- .....

Flux Calibrators: Radio Stars

Pardo et al. (2009)



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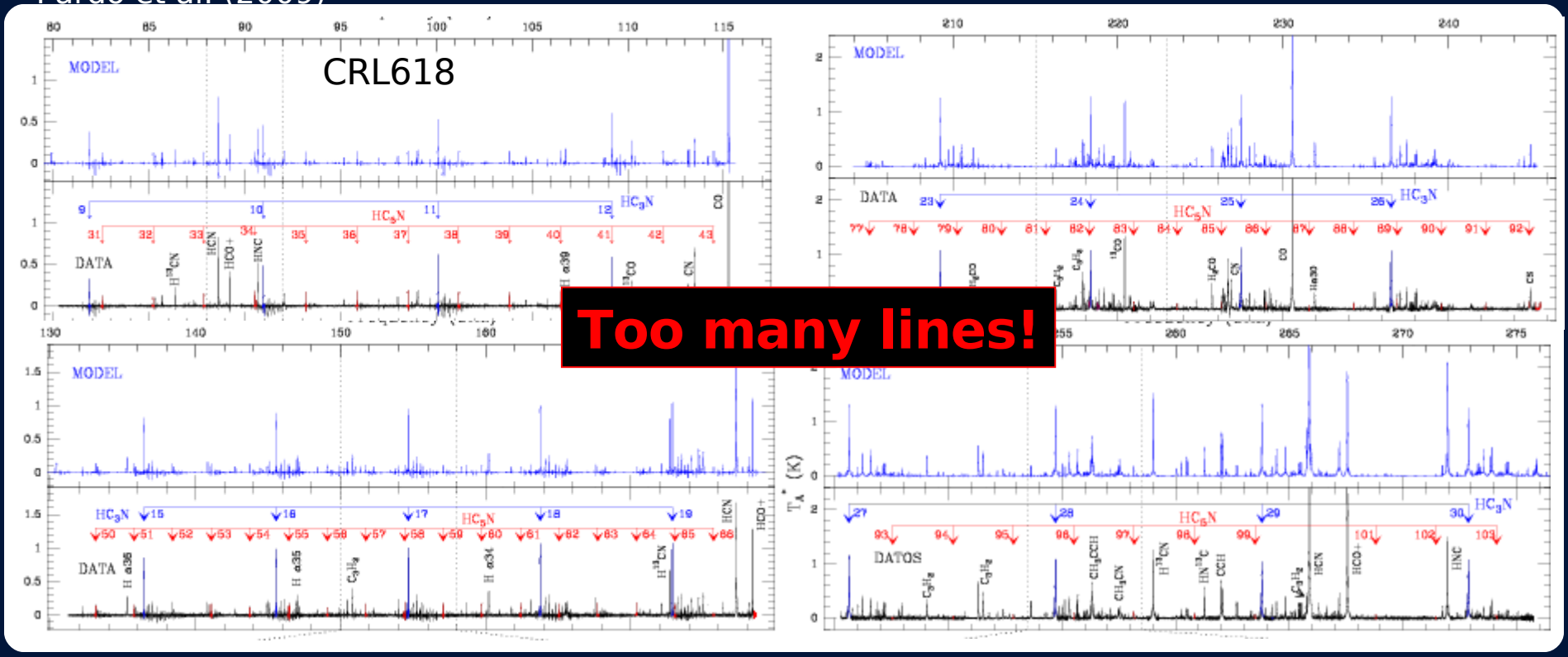

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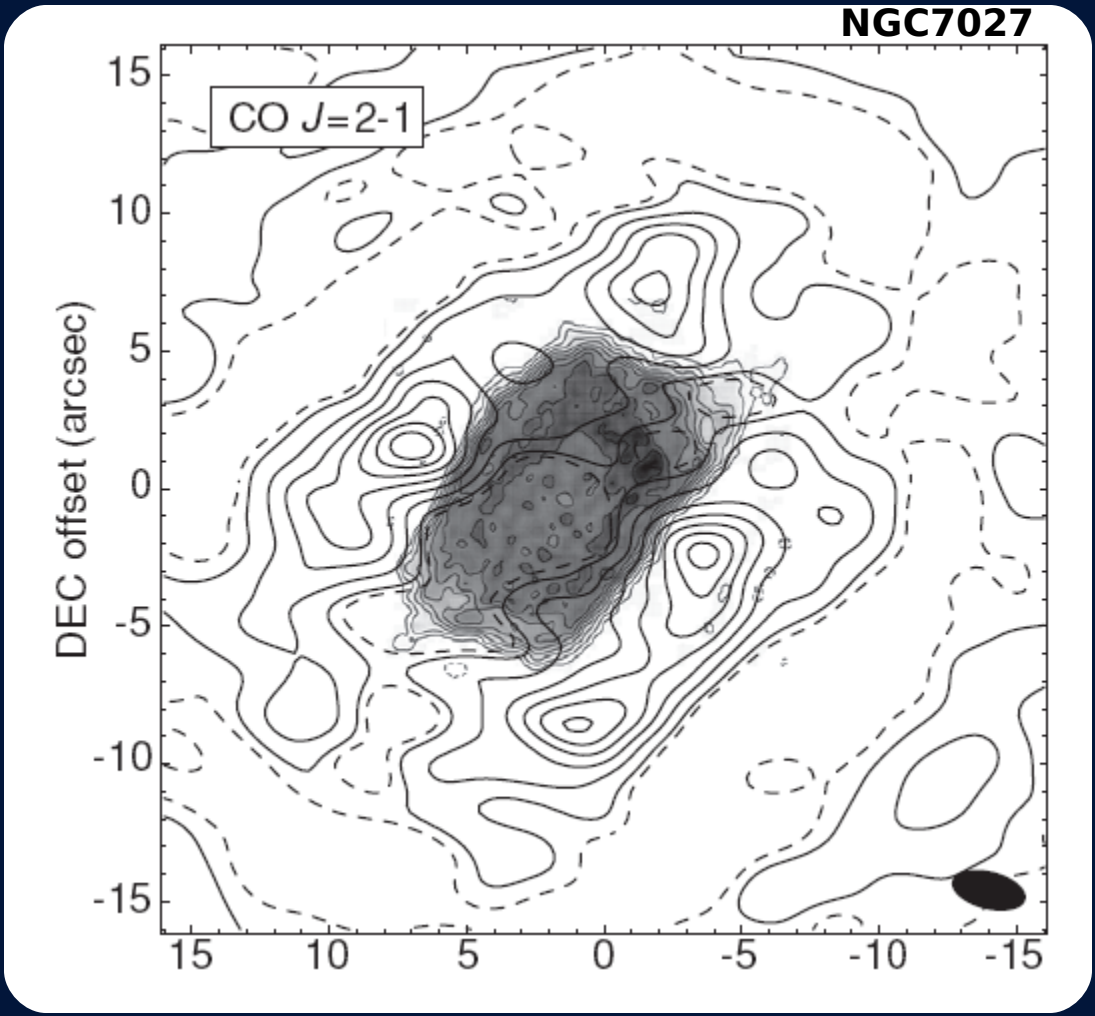

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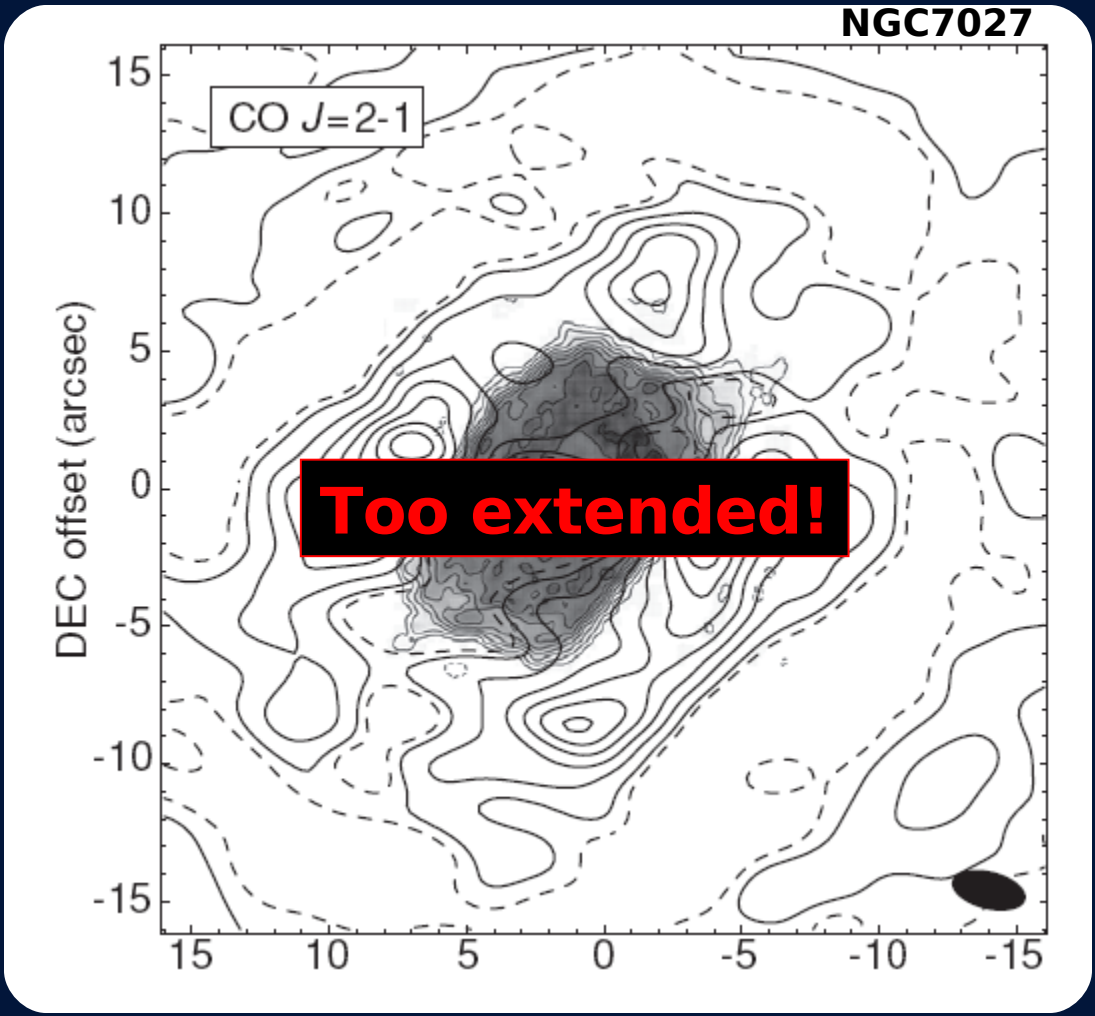

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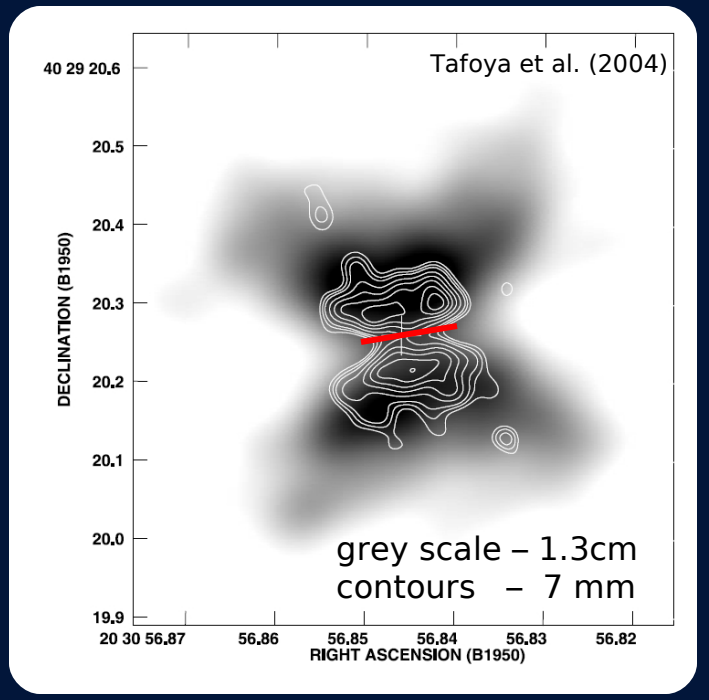

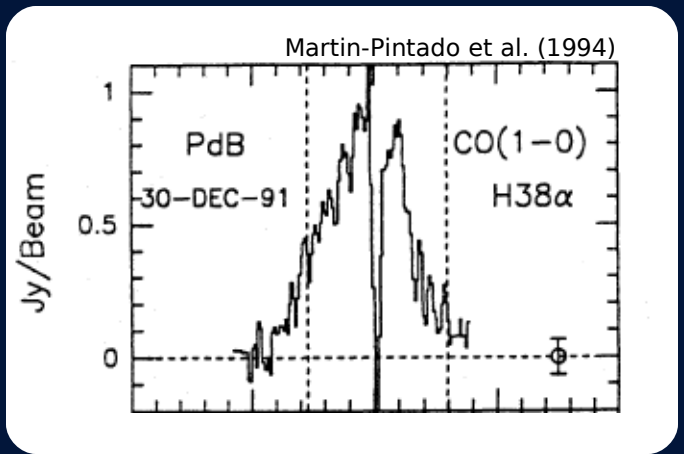

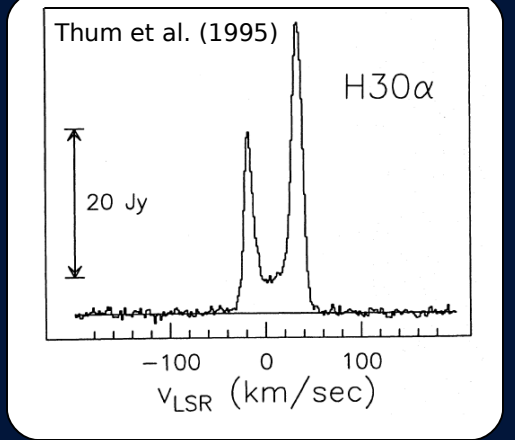

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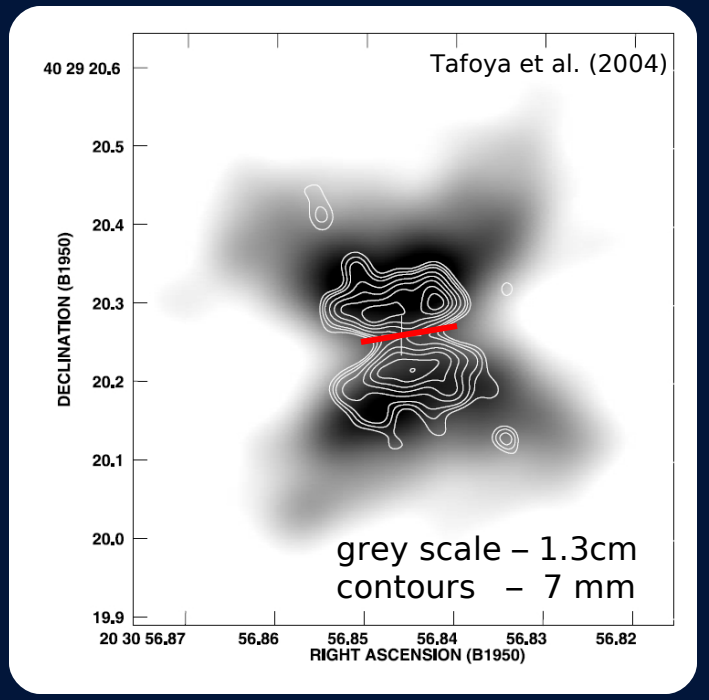

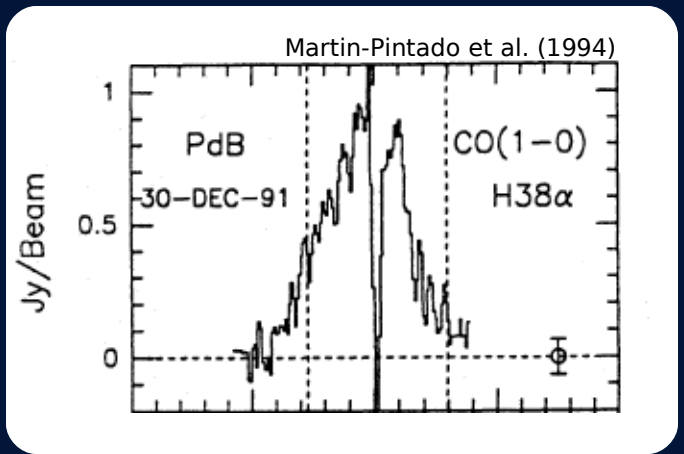

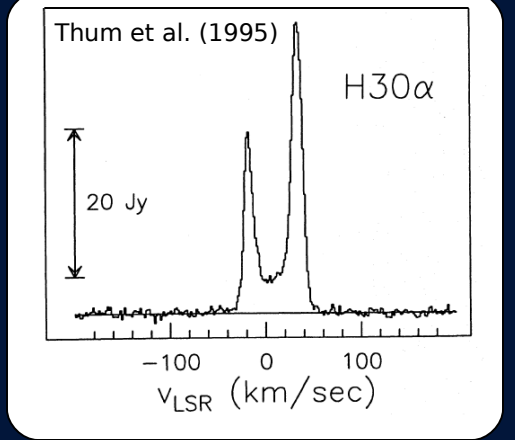

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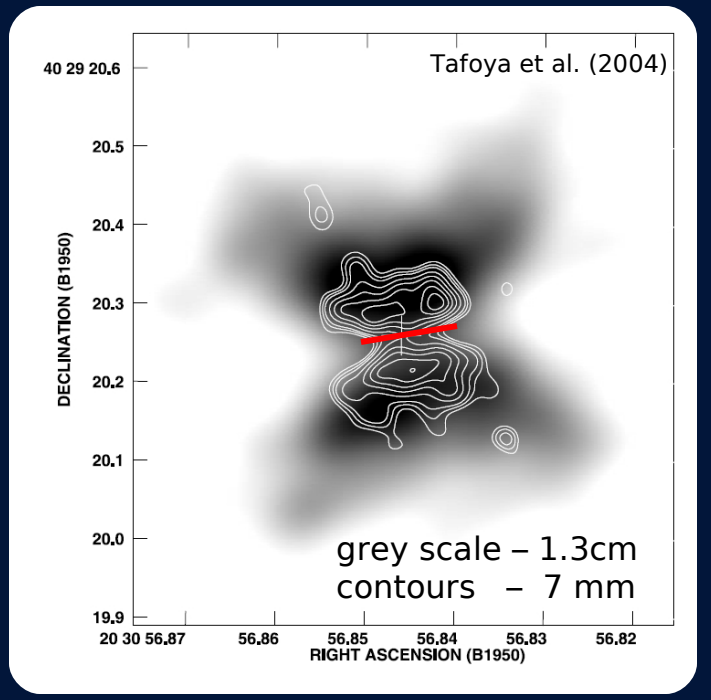

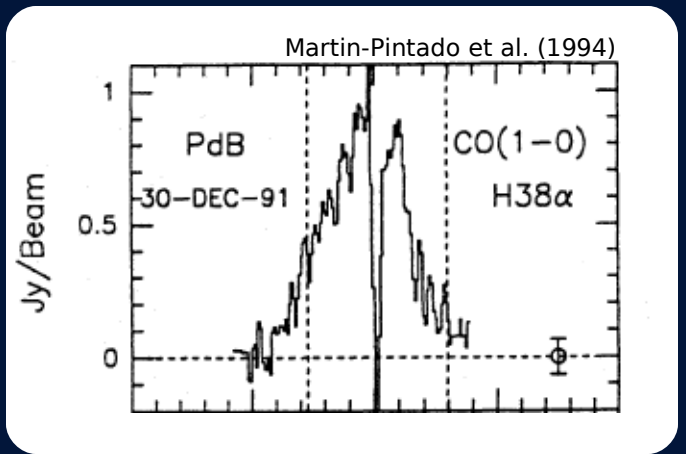

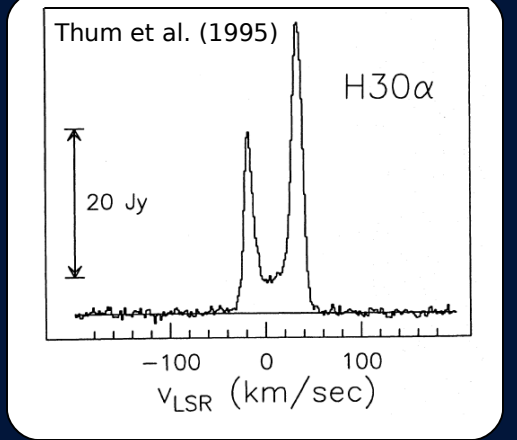

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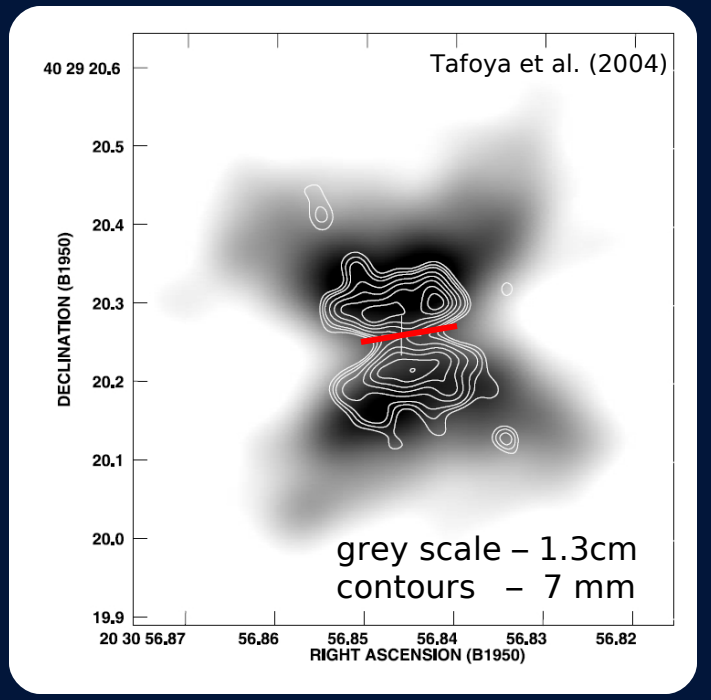

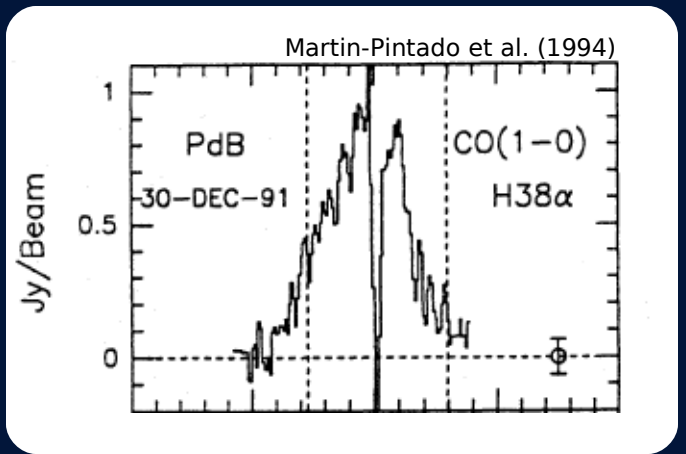

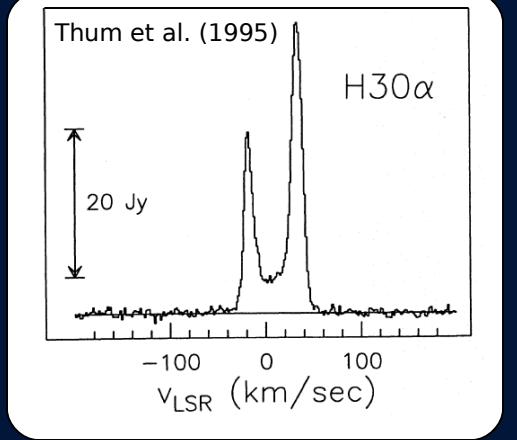

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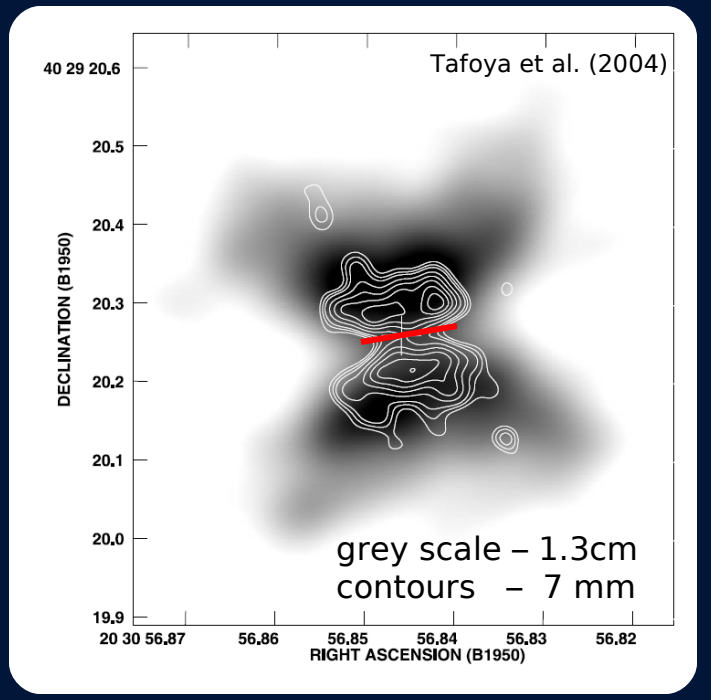

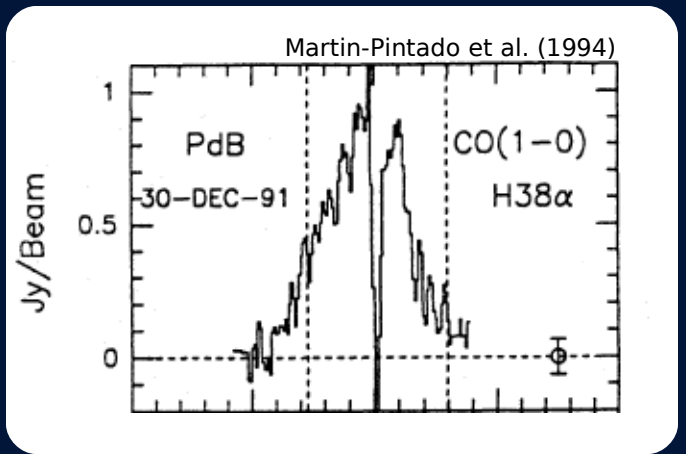

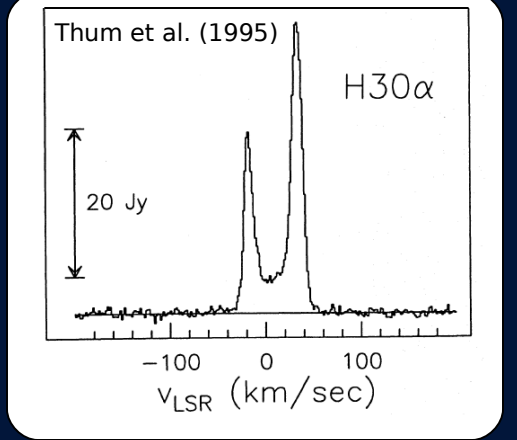

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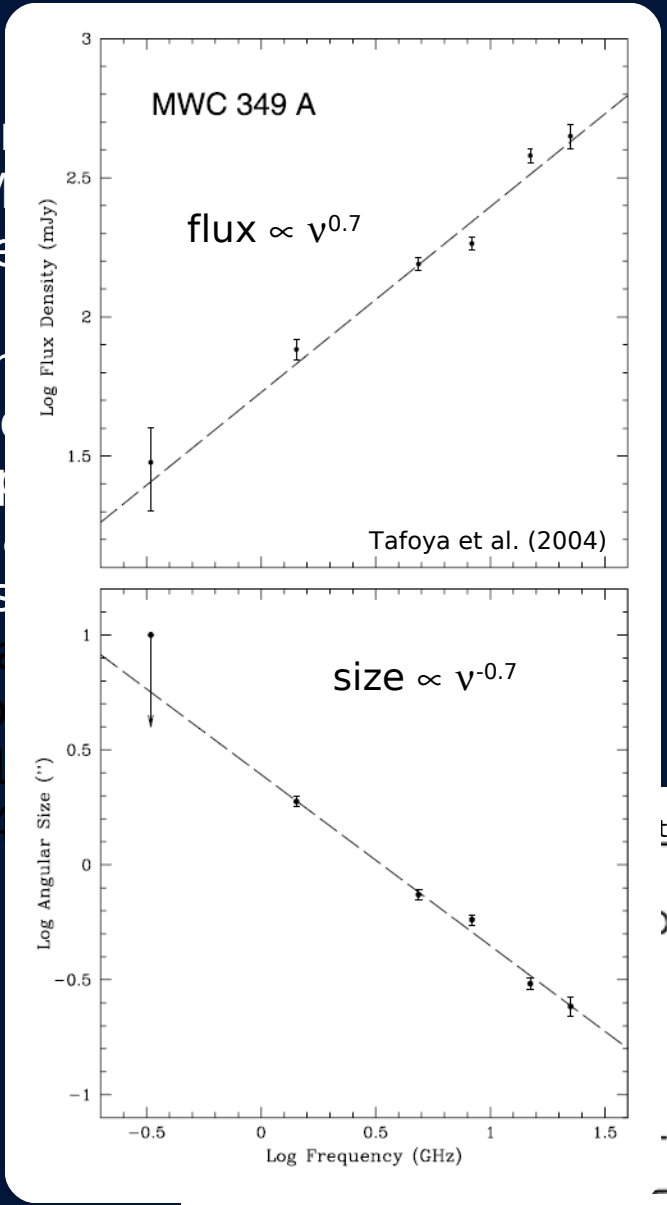

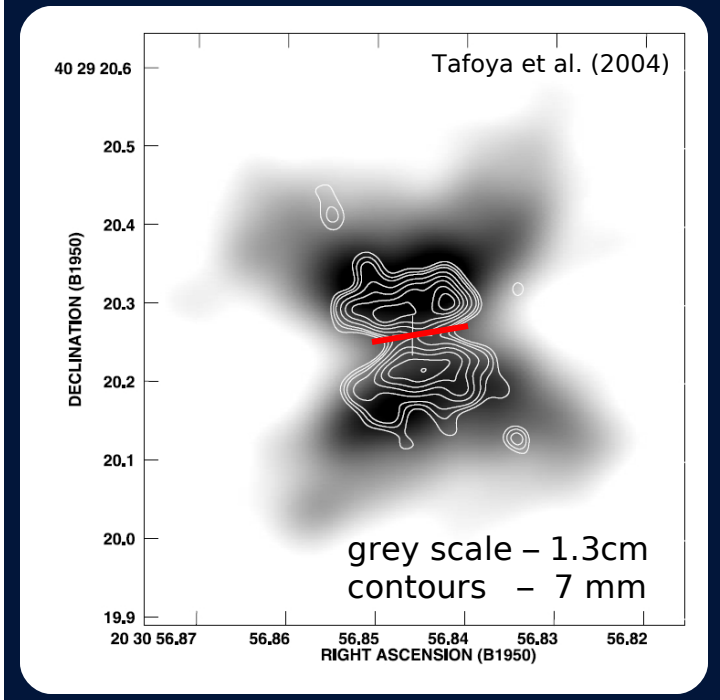

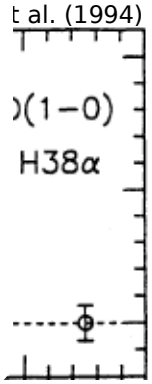

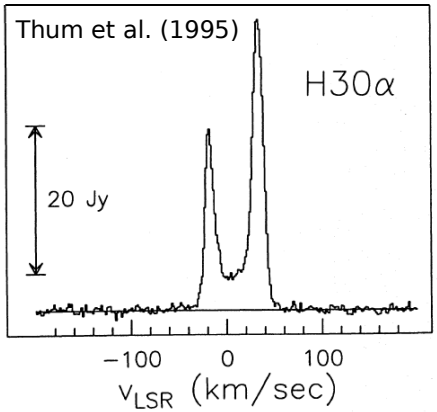

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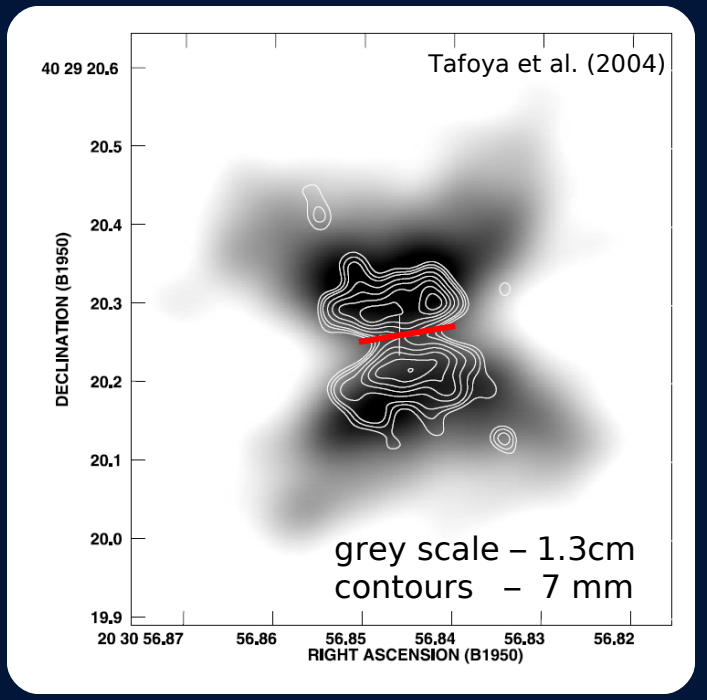

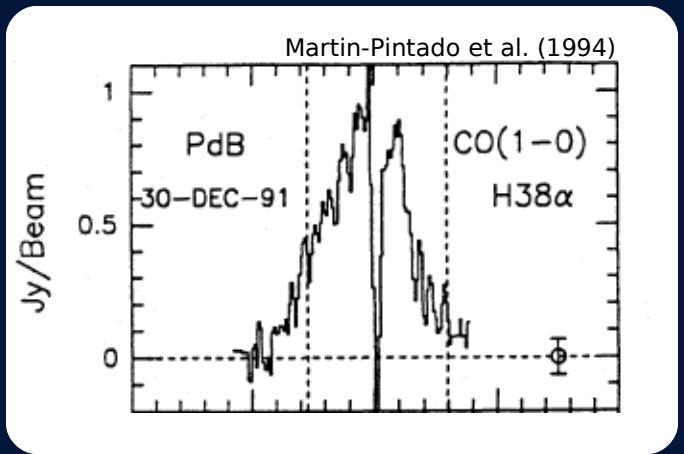

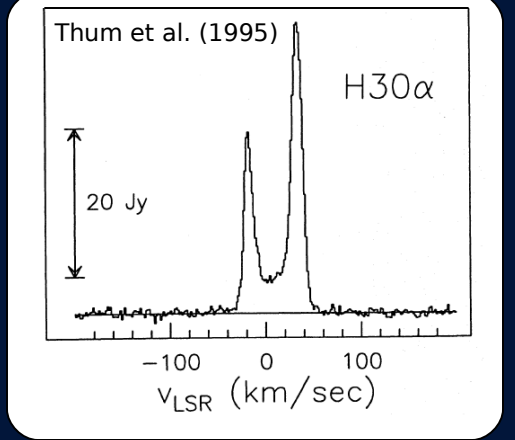

Flux Calibrators: MWC349

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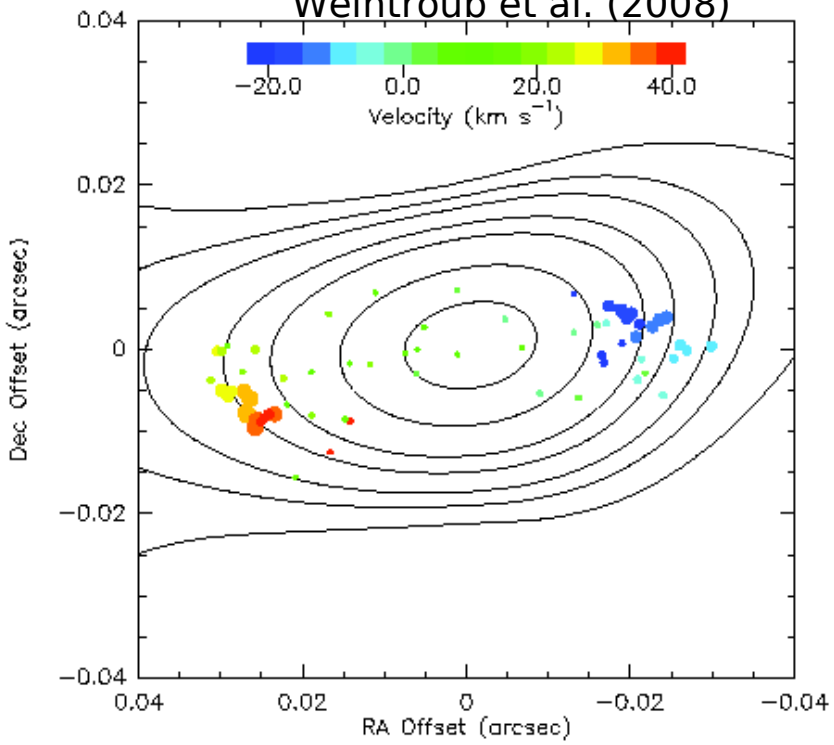
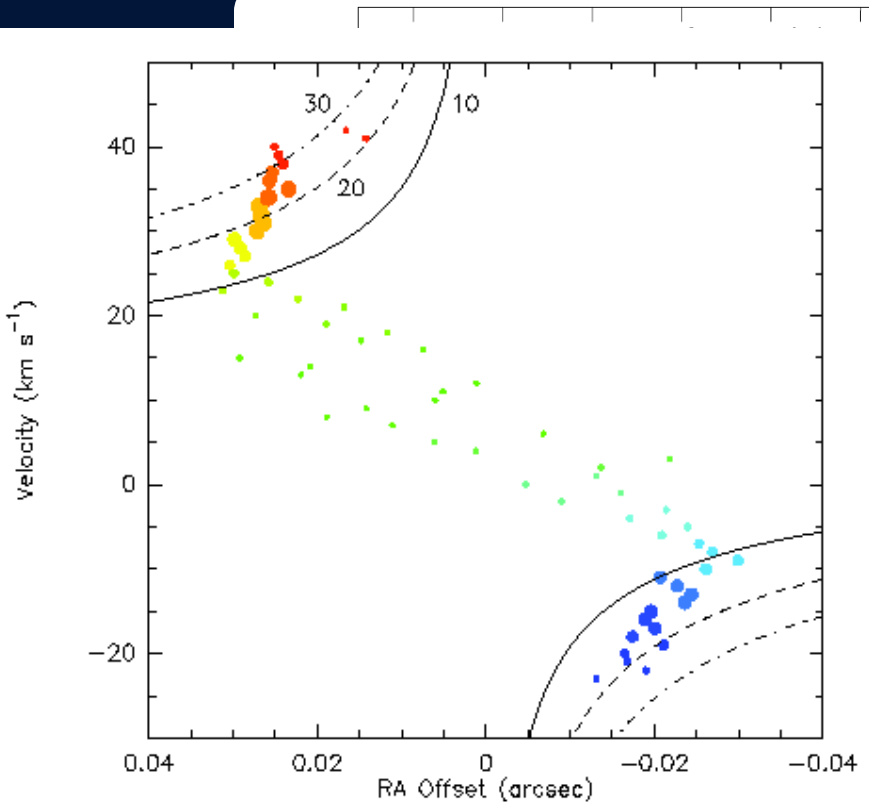
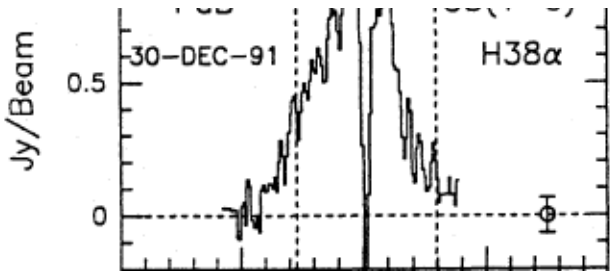
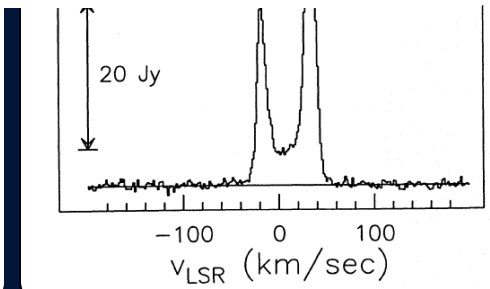
Weintroub et al. (2008)









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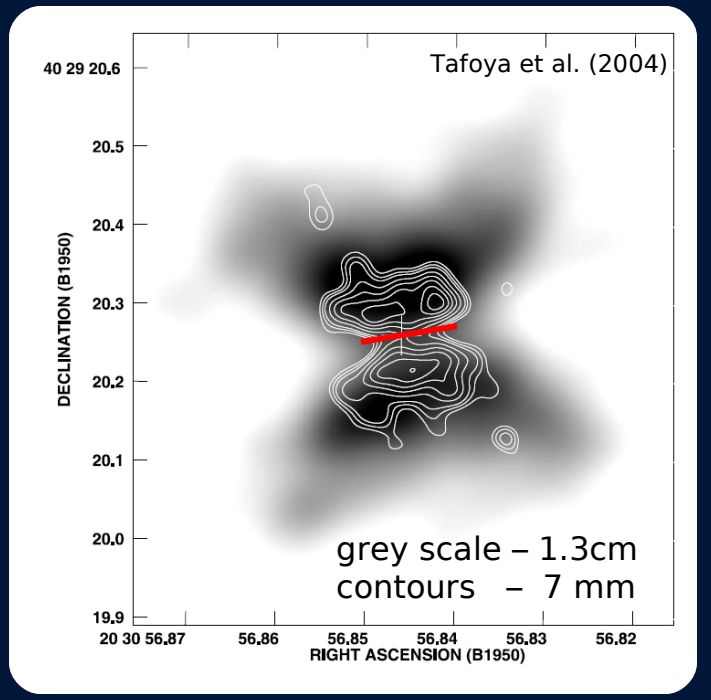

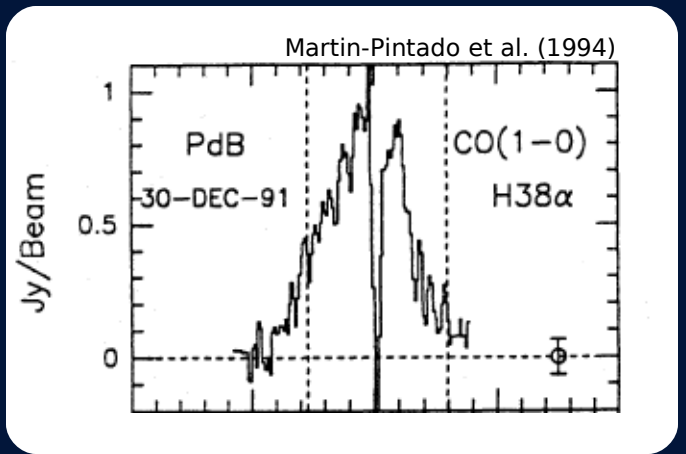

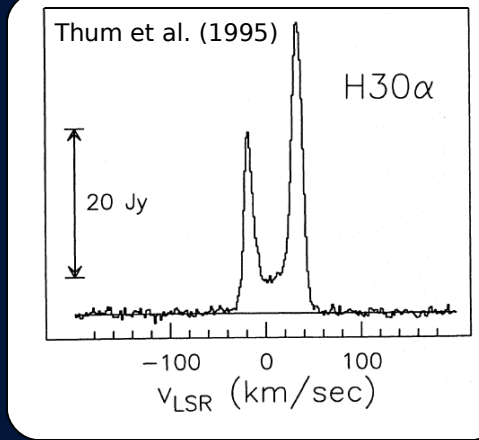

Flux Calibrators: MWC349

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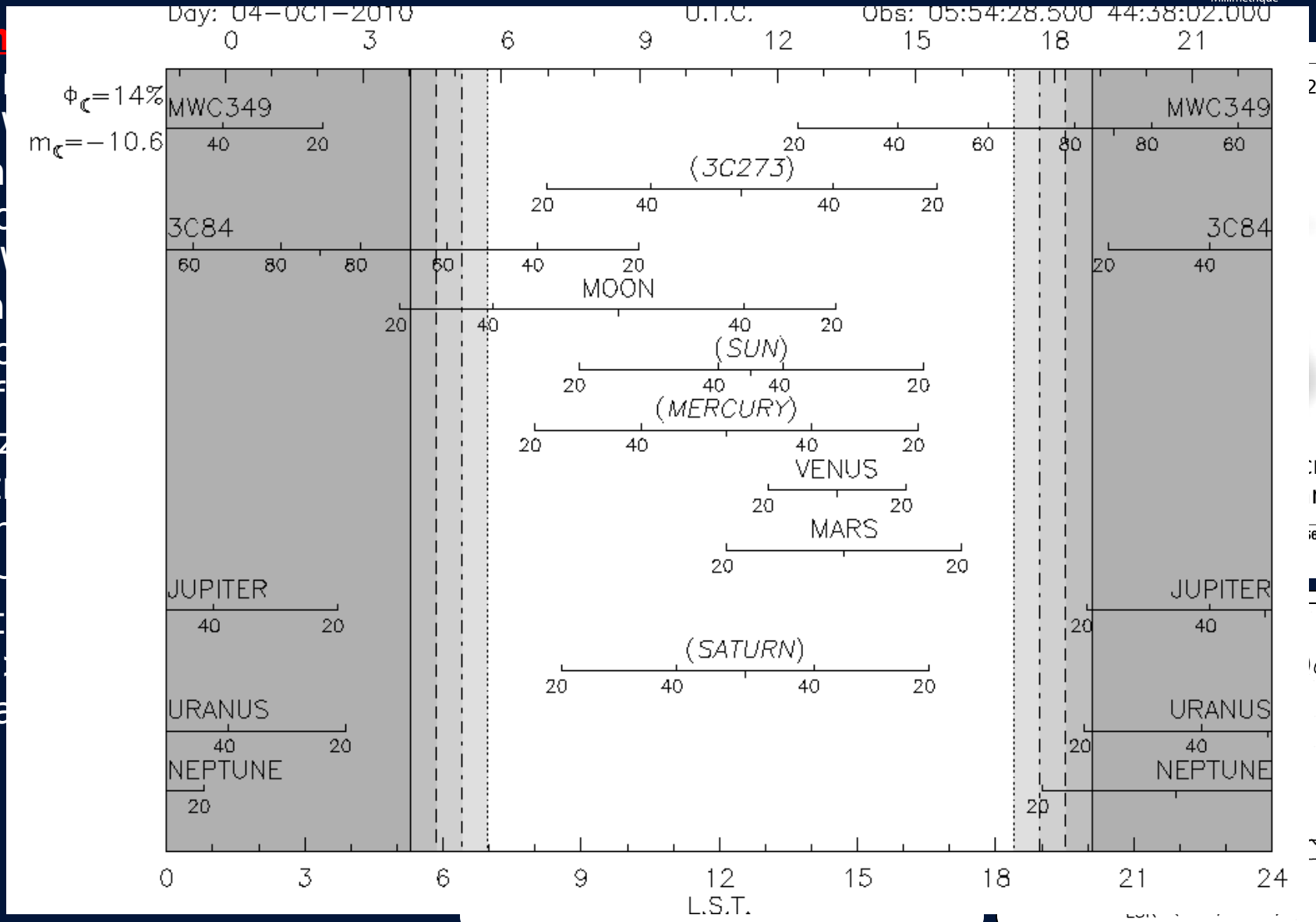
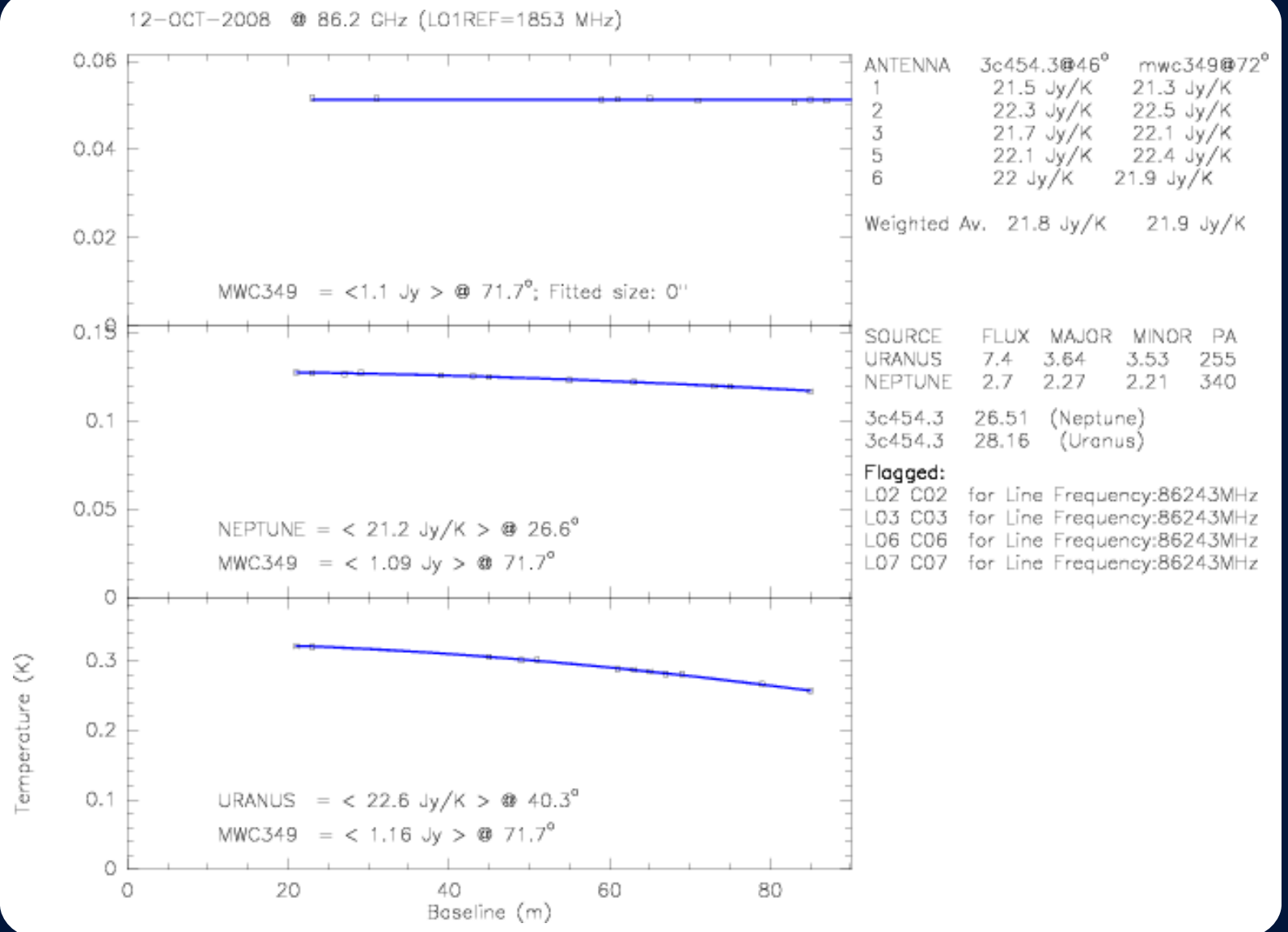
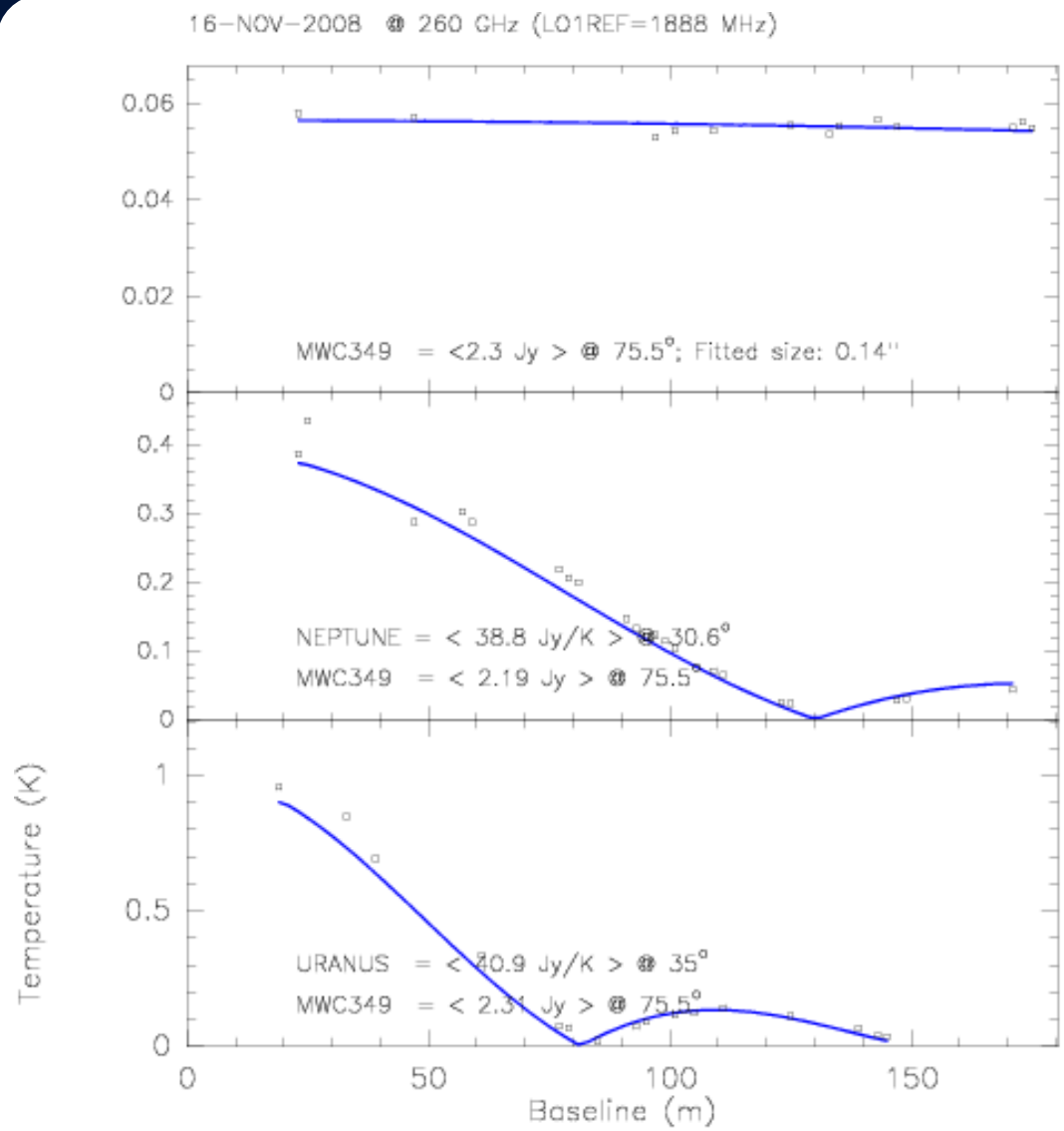


How to calibrate a calibrator?



How to calibrate a calibrator?

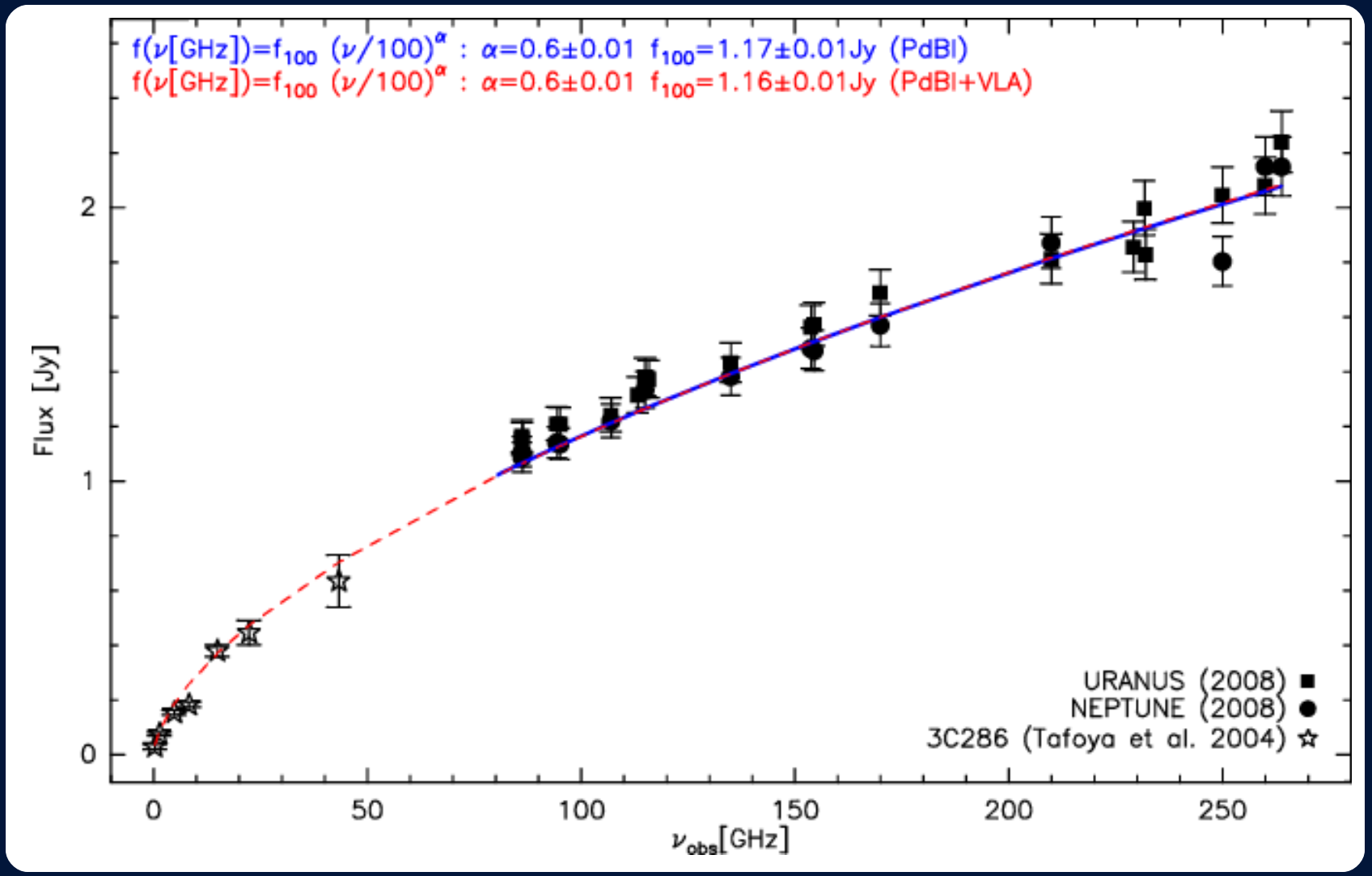


ANTENNA	3c454.3@52°	mwc349@75°
1	39.9 Jy/K	41.2 Jy/K
2	34.6 Jy/K	35.8 Jy/K
3	41.8 Jy/K	45.3 Jy/K
4	51.4 Jy/K	50.4 Jy/K
5	34.5 Jy/K	34.9 Jy/K
6	39.9 Jy/K	40.5 Jy/K
Weighted Av.	38 Jy/K	39.3 Jy/K

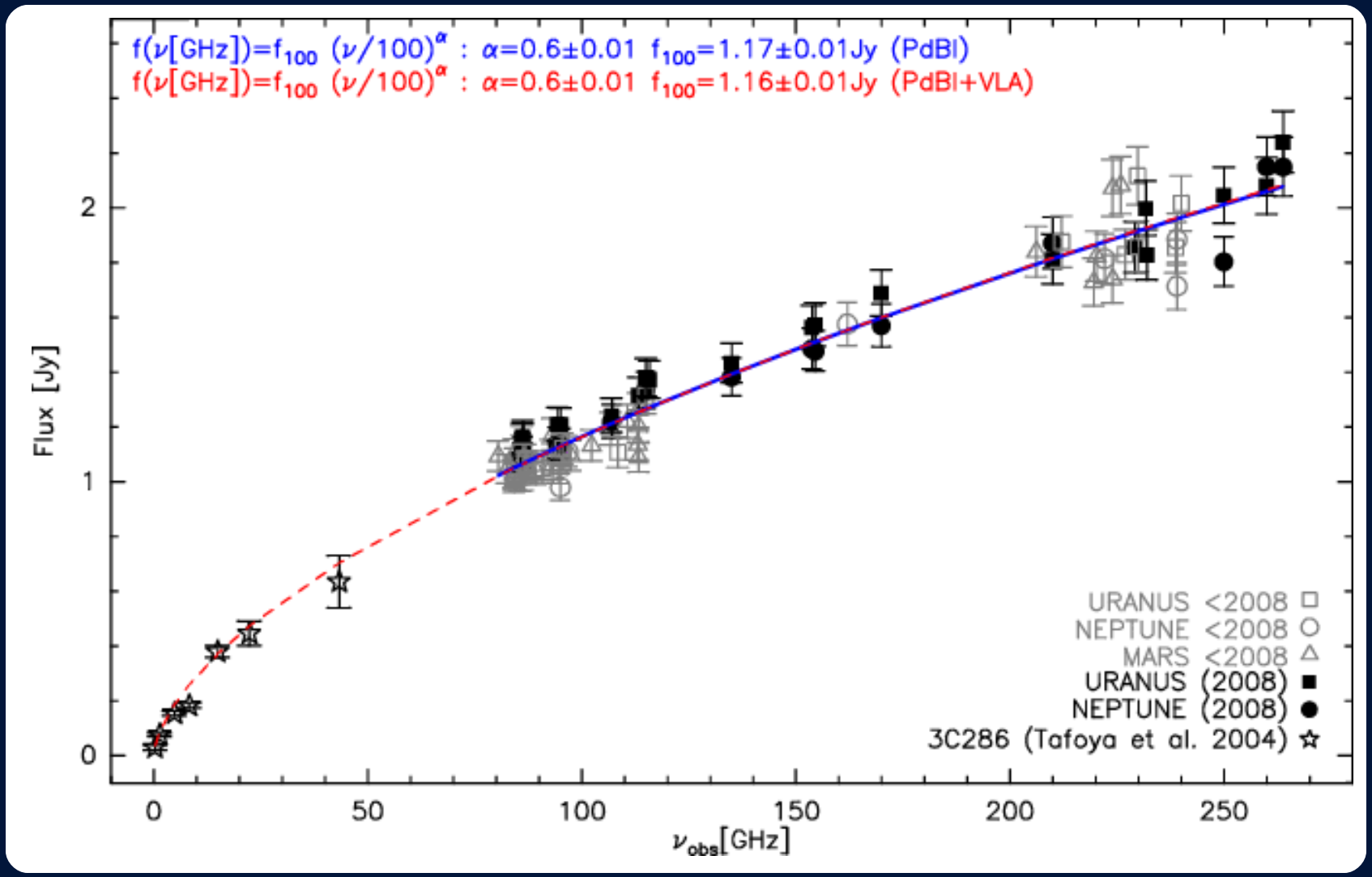
SOURCE	FLUX	MAJOR	MINOR	PA
URANUS	41.1	3.56	3.45	255
NEPTUNE	15.4	2.23	2.17	340

3c454.3 13.76 (Neptune)
3c454.3 14.5 (Uranus)

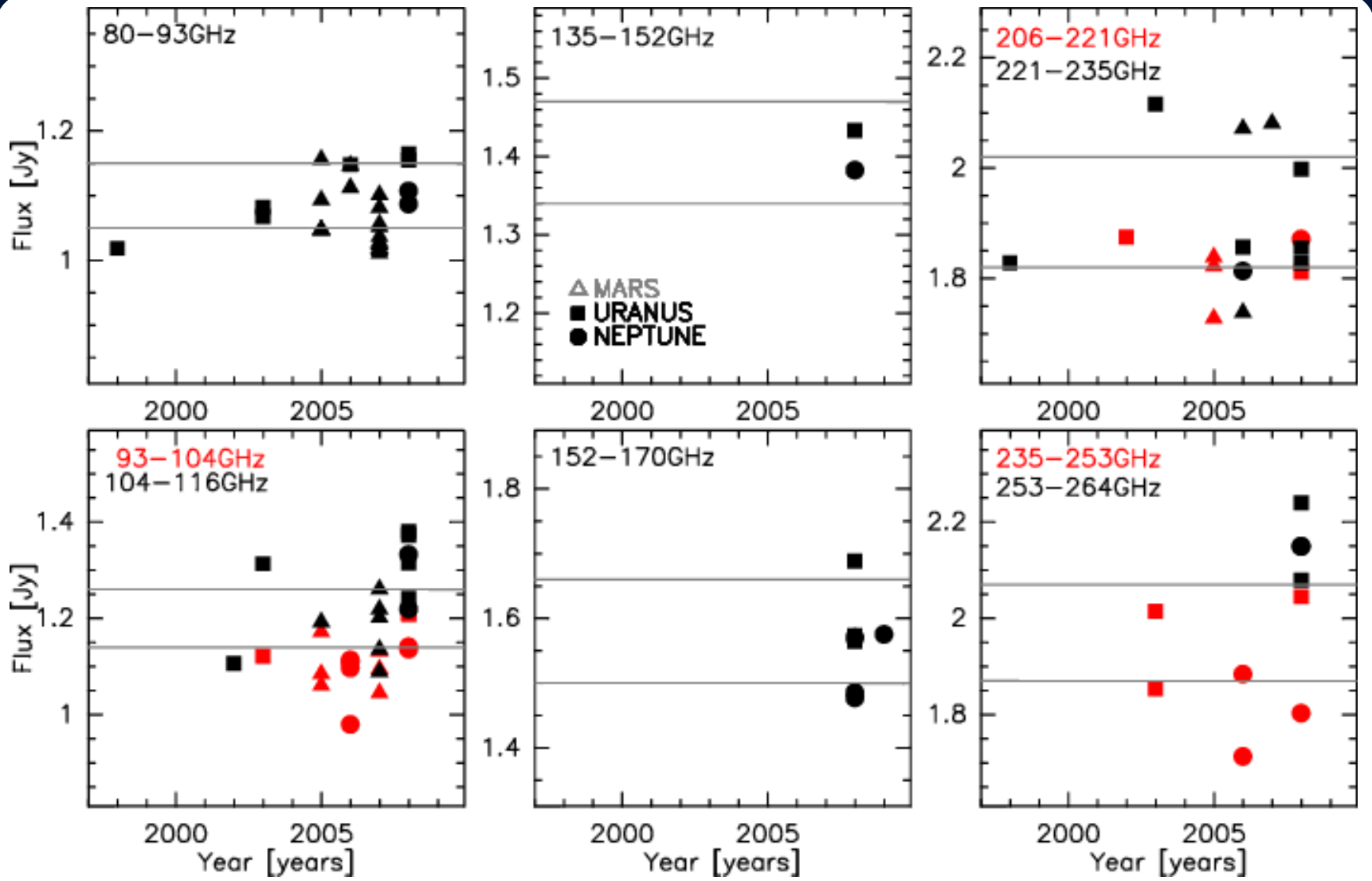
Flux of MWC348: SED



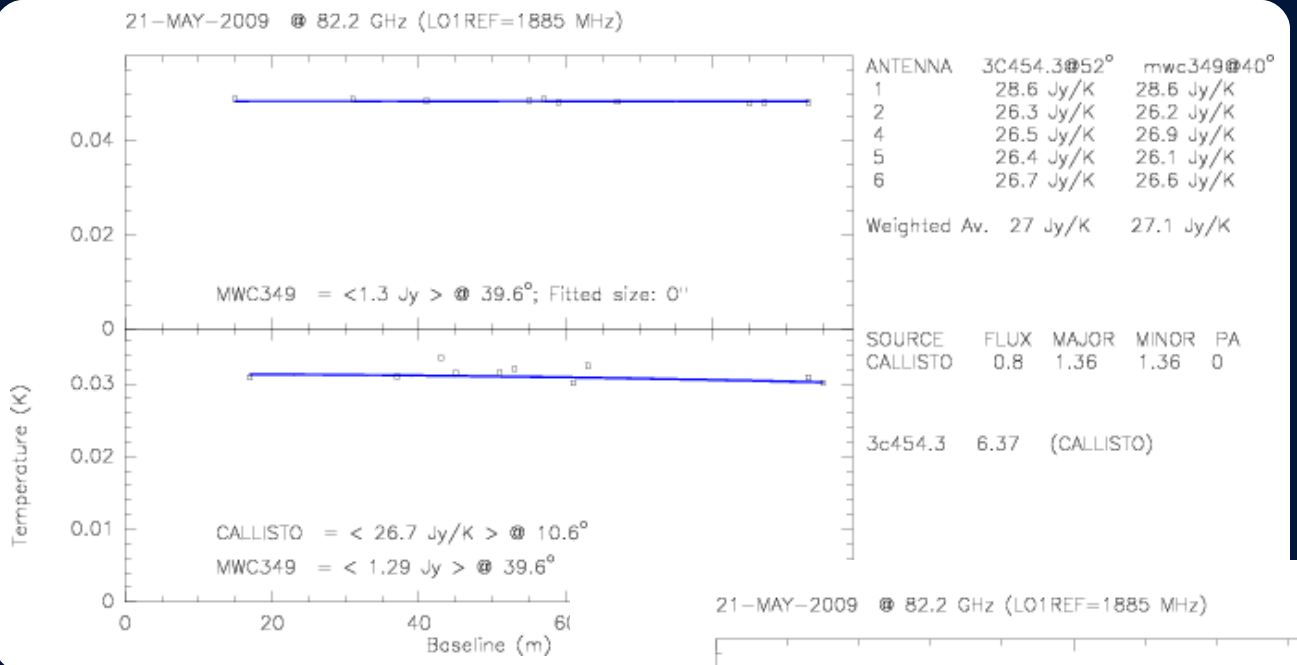
Flux of MWC348: SED



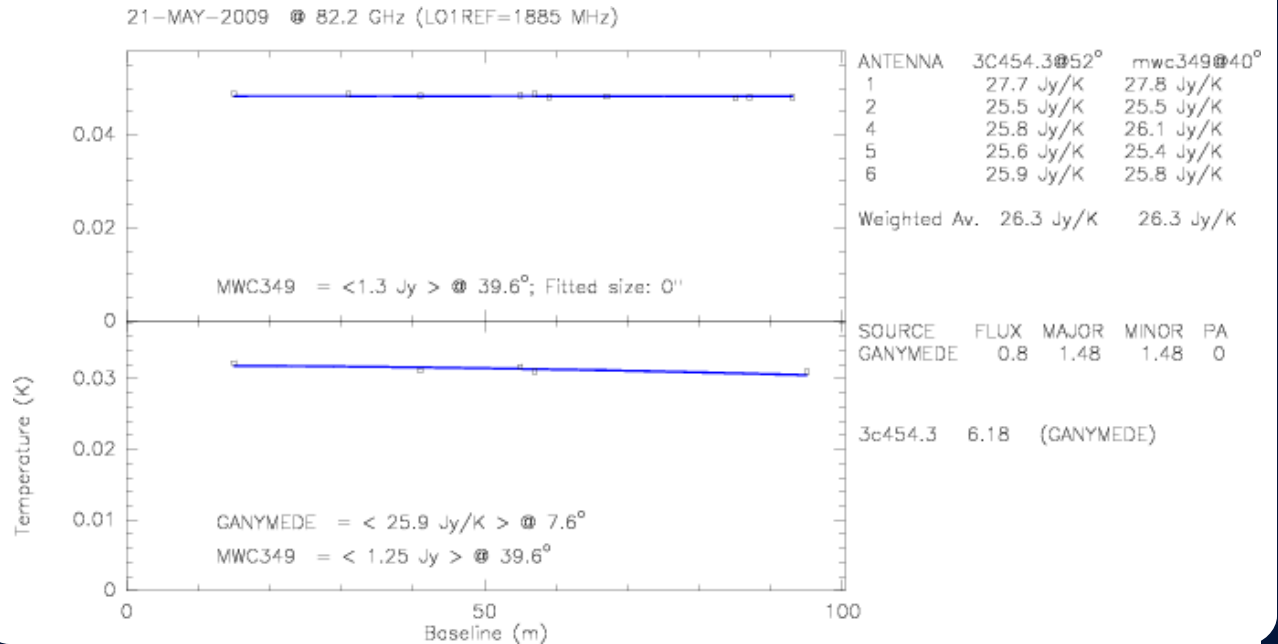
Flux of MWC348: Time variability?



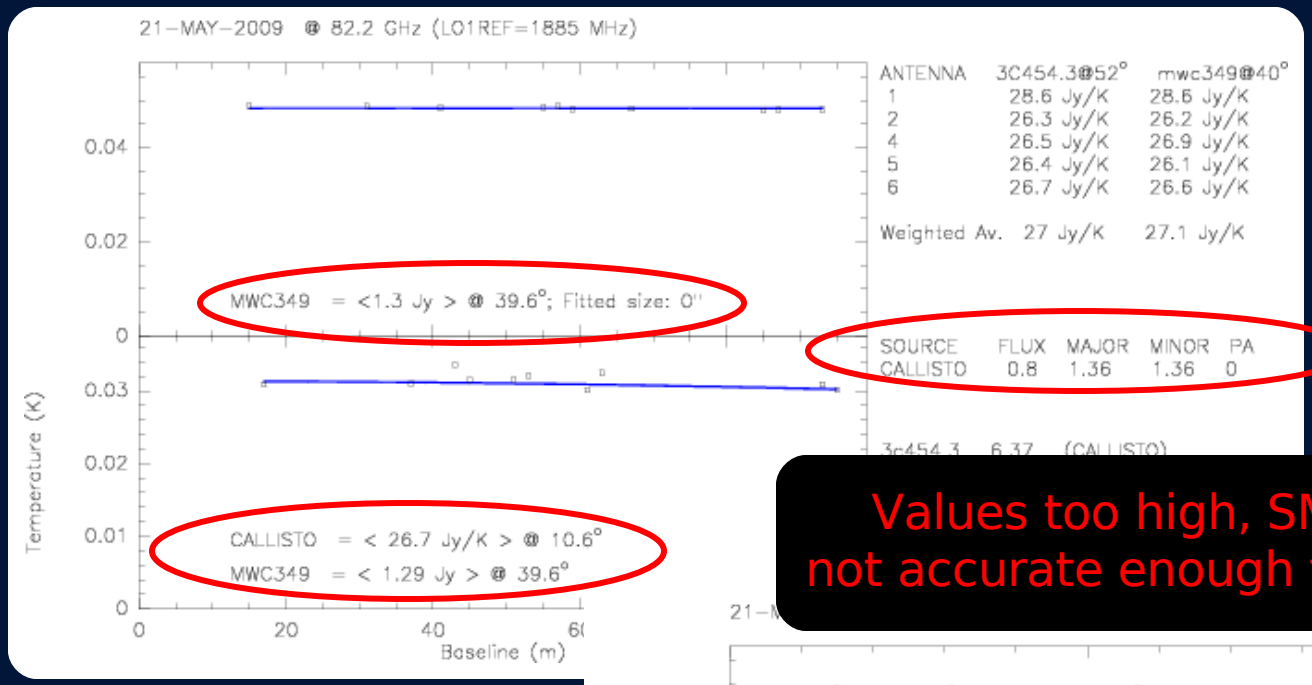
Flux of MWC348: Using satellites?



Using SMA model!

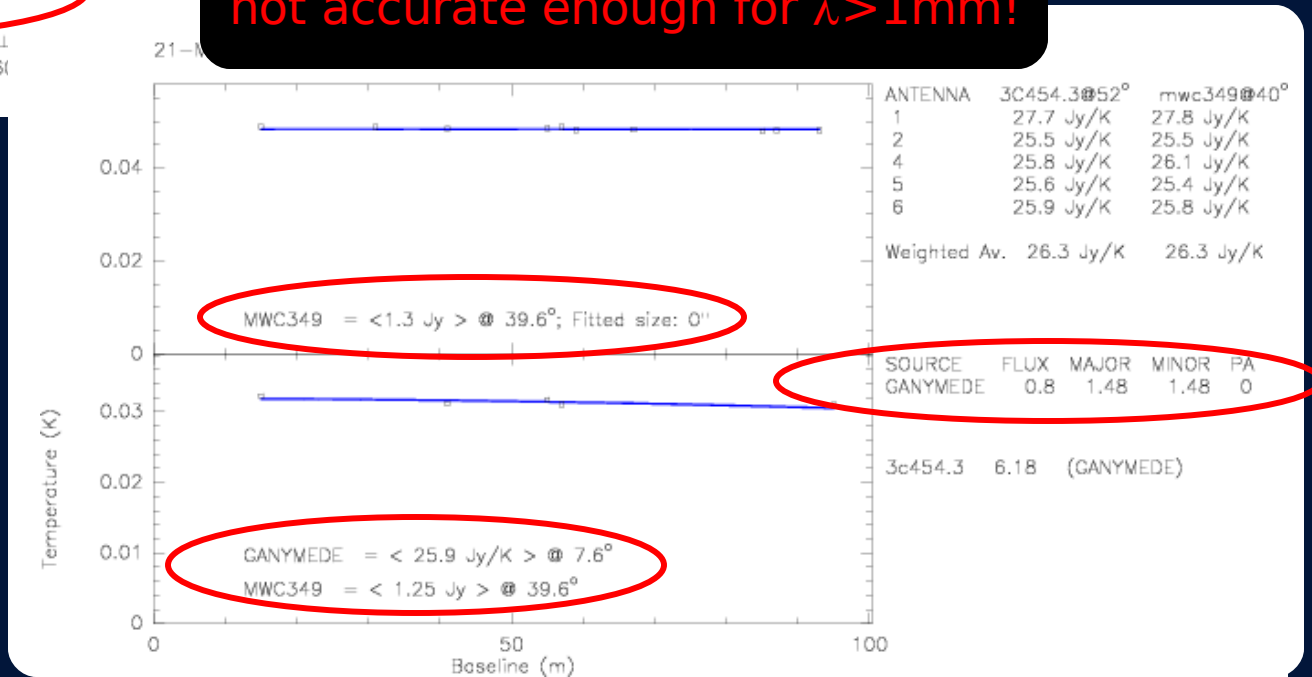


Flux of MWC348: Using satellites?

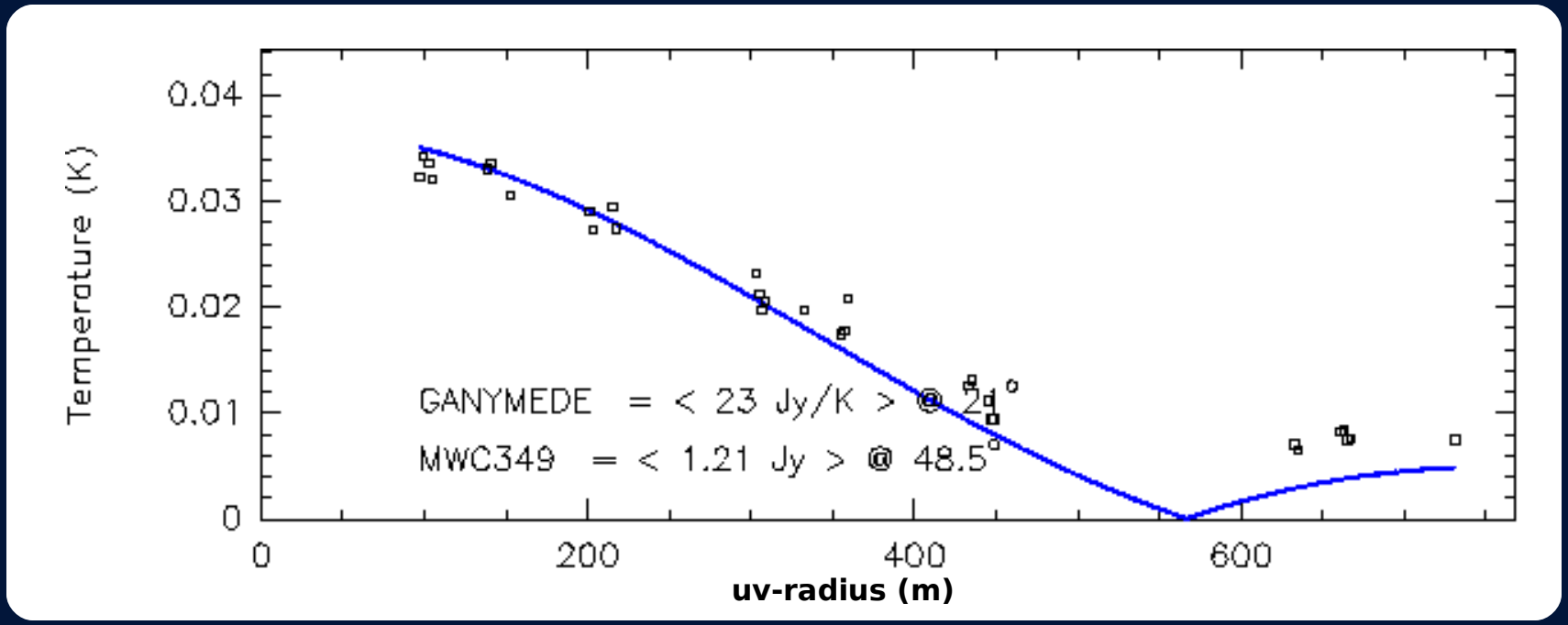


Using SMA model!

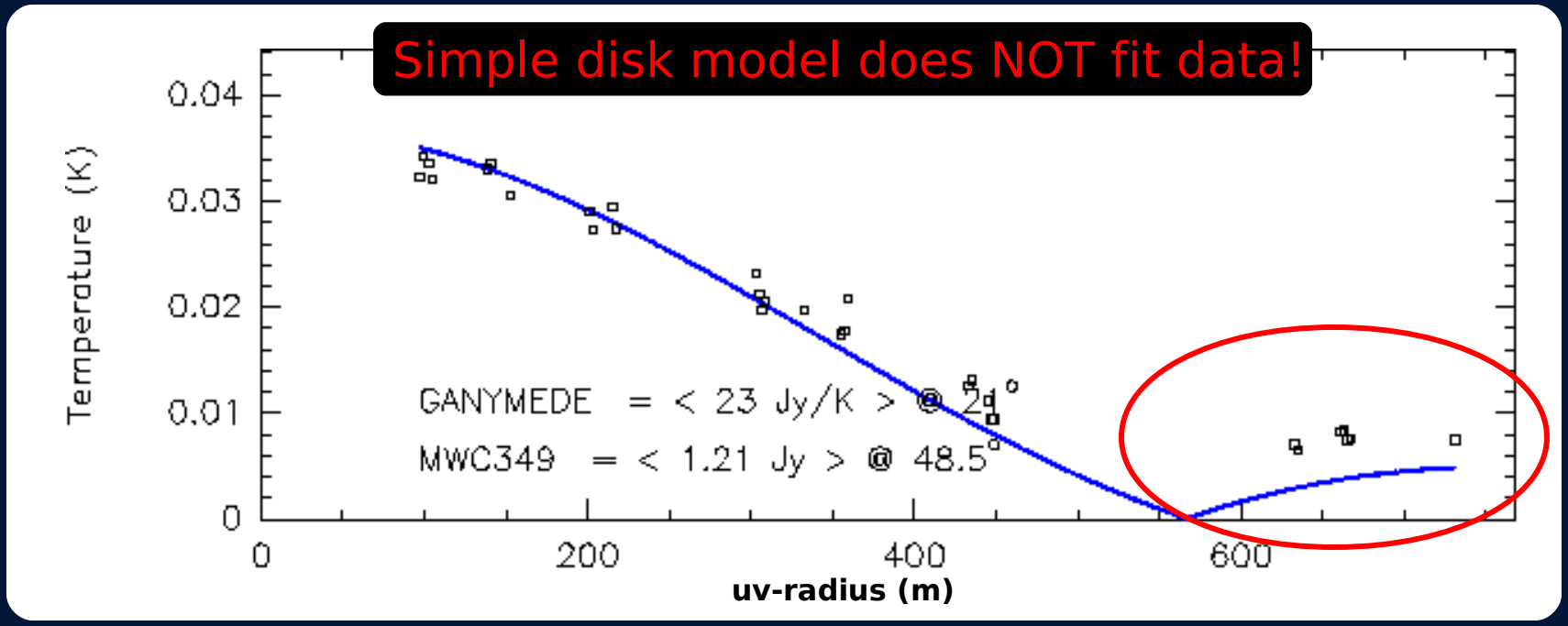
Values too high, SMA model not accurate enough for λ>1mm!



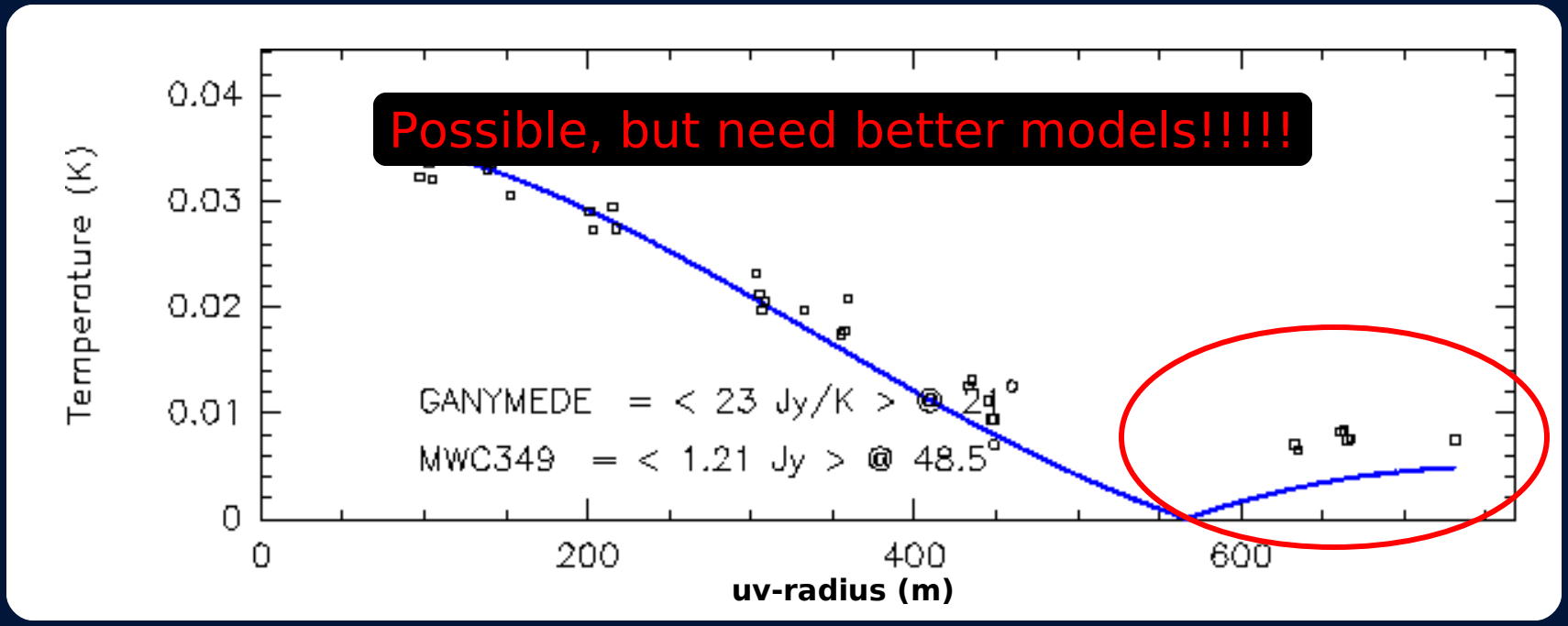
Flux of MWC348: Using satellites?



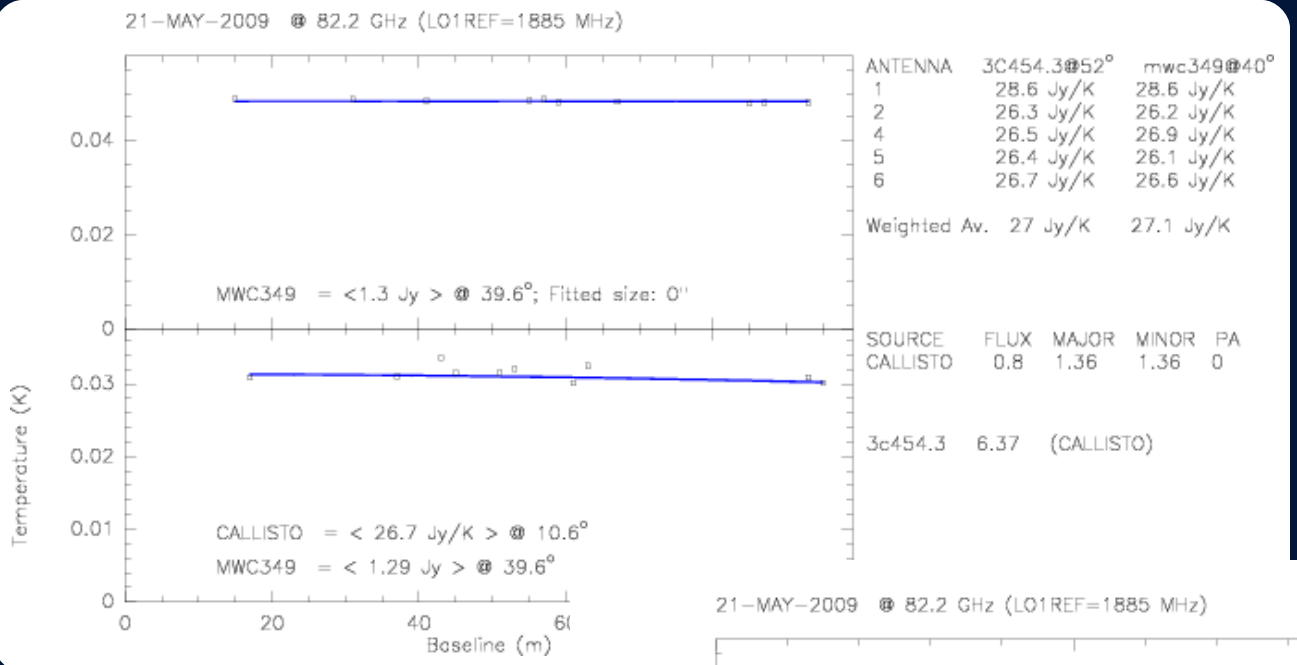
Flux of MWC348: Using satellites?



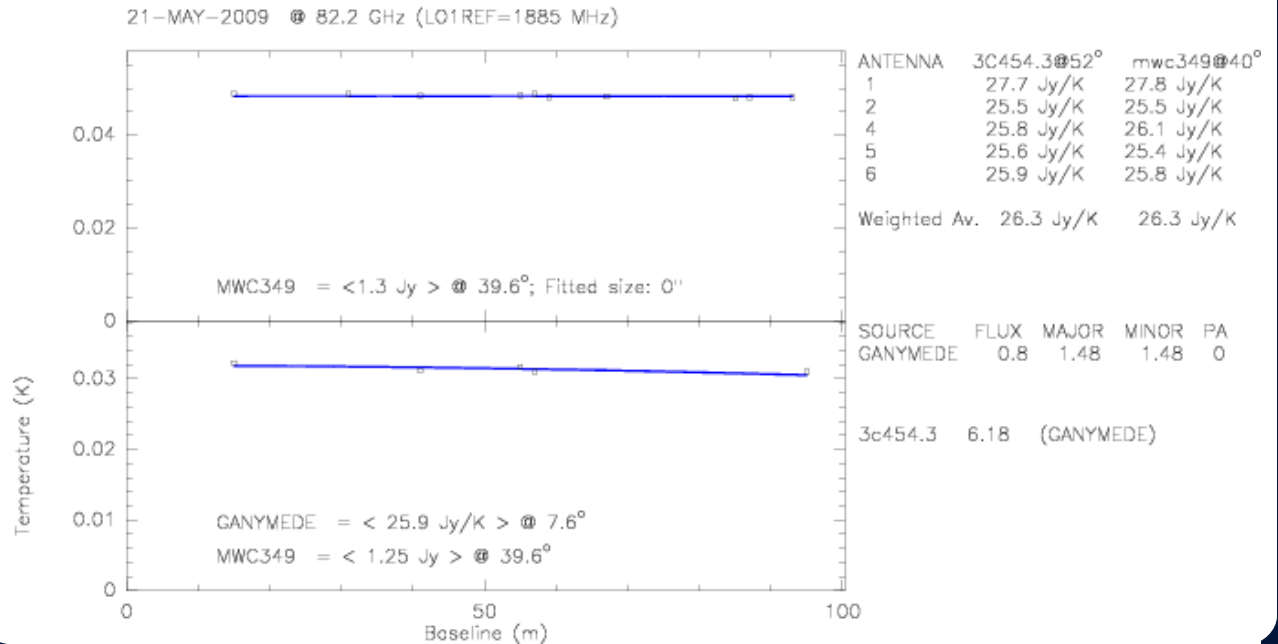
Flux of MWC348: Using satellites?



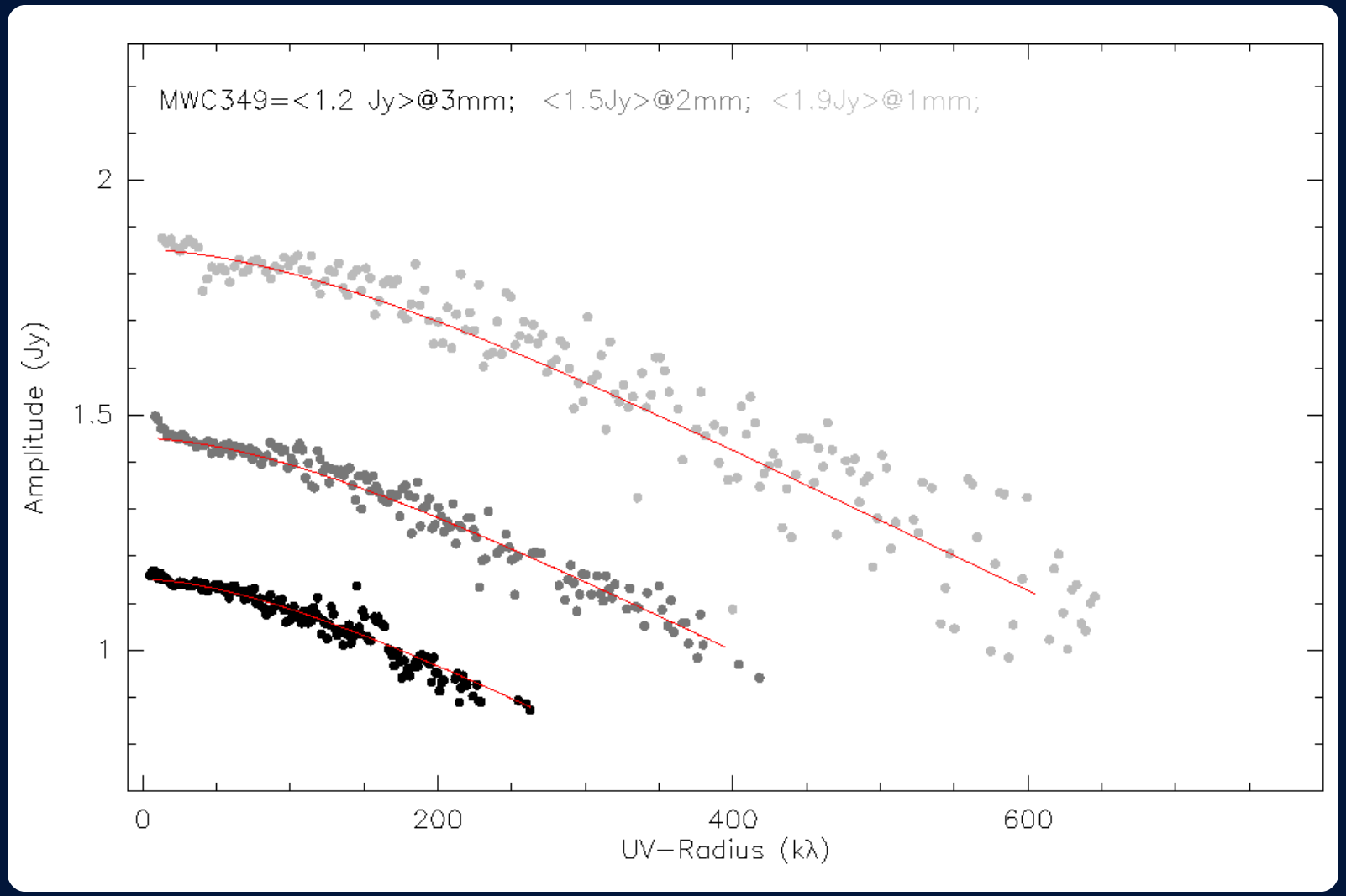
Flux of MWC348: Using satellites?



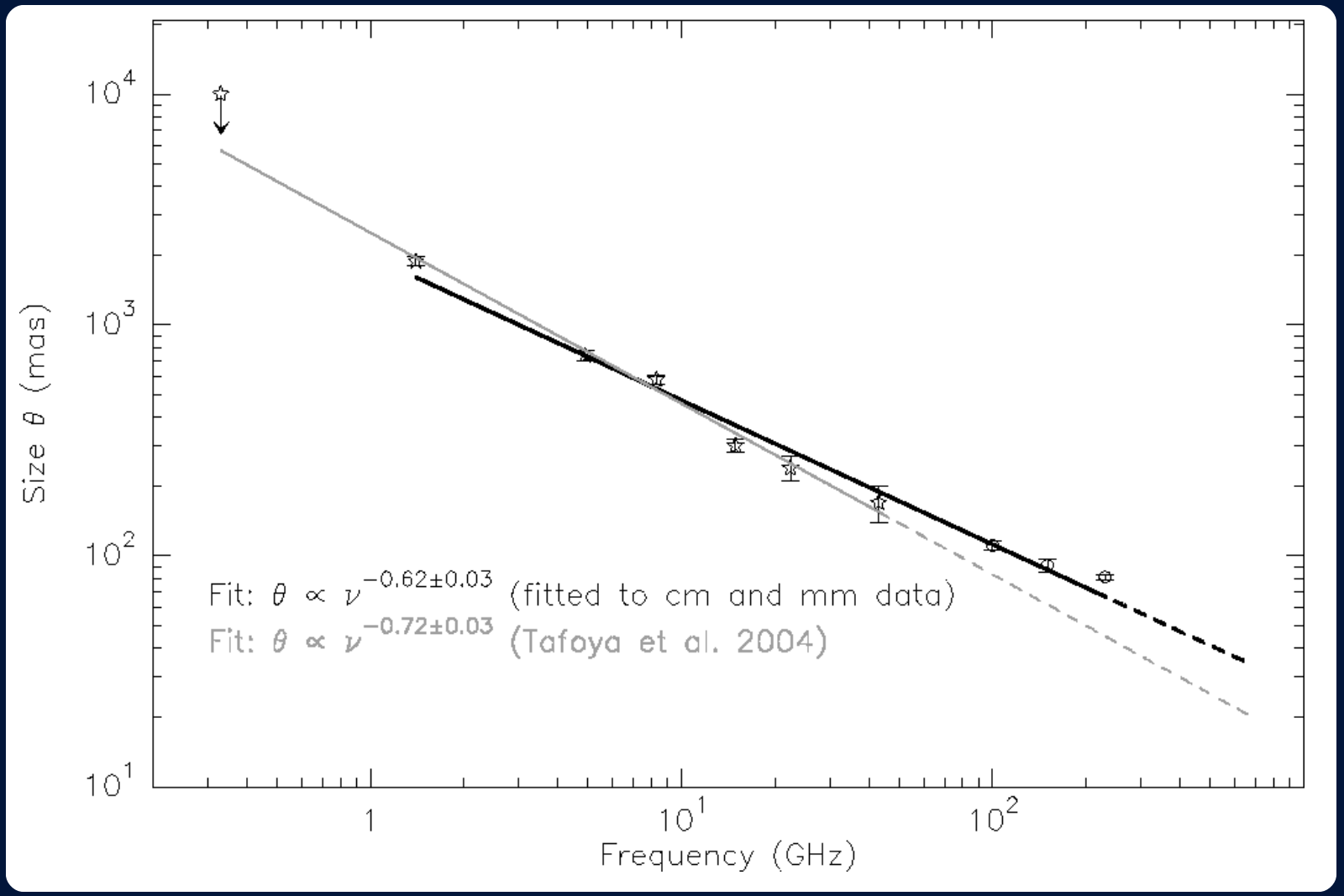
Using SMA model!



Size of MWC348



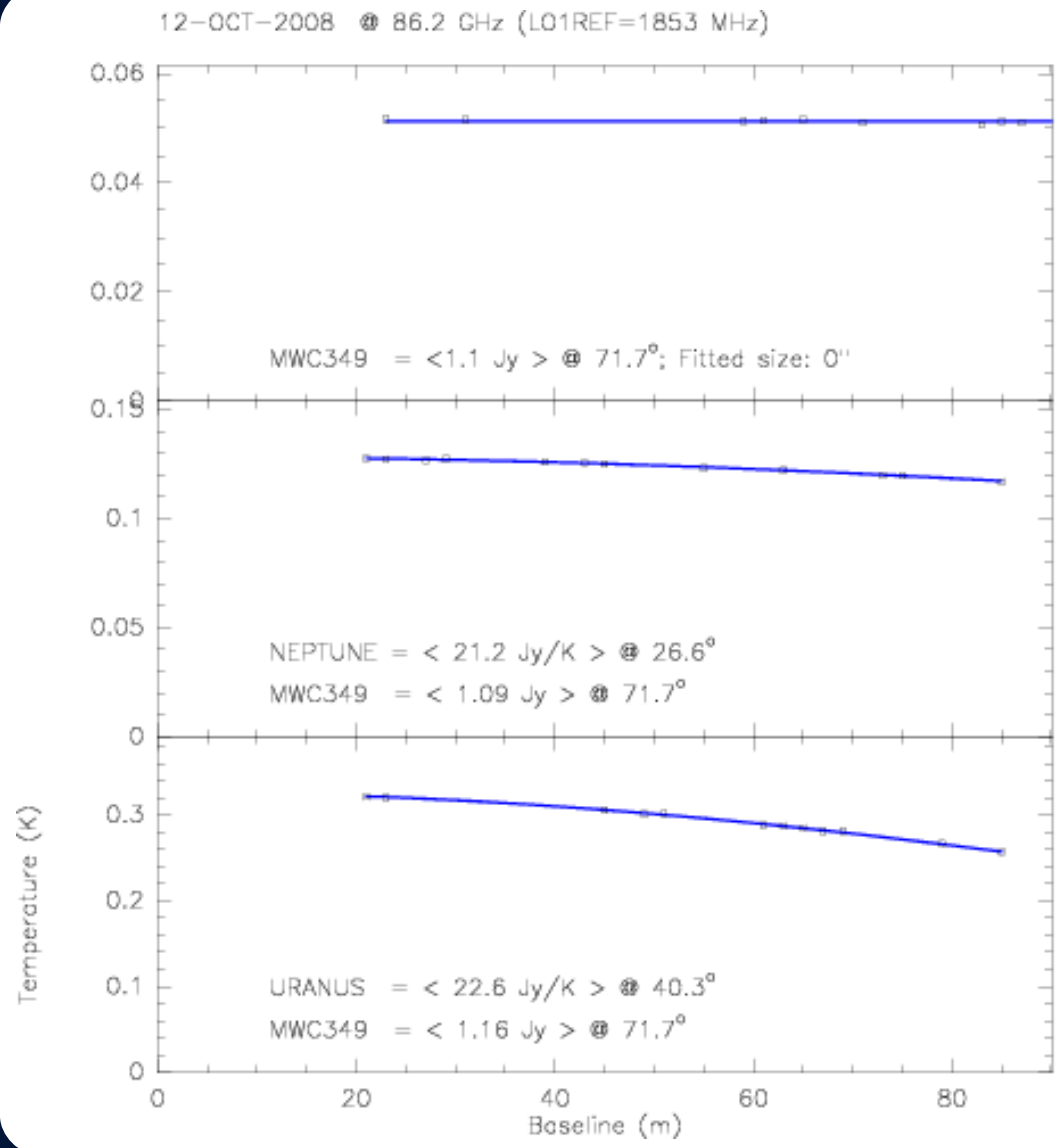
Size of MWC348



Primary Flux Calibrators

1. Quasars
2. Planets
3. Solar Bodies (Satellites, Asteroids, Dwarf Planets)
4. Radio Stars
5. Antenna Efficiencies?

“By-product” of calibration



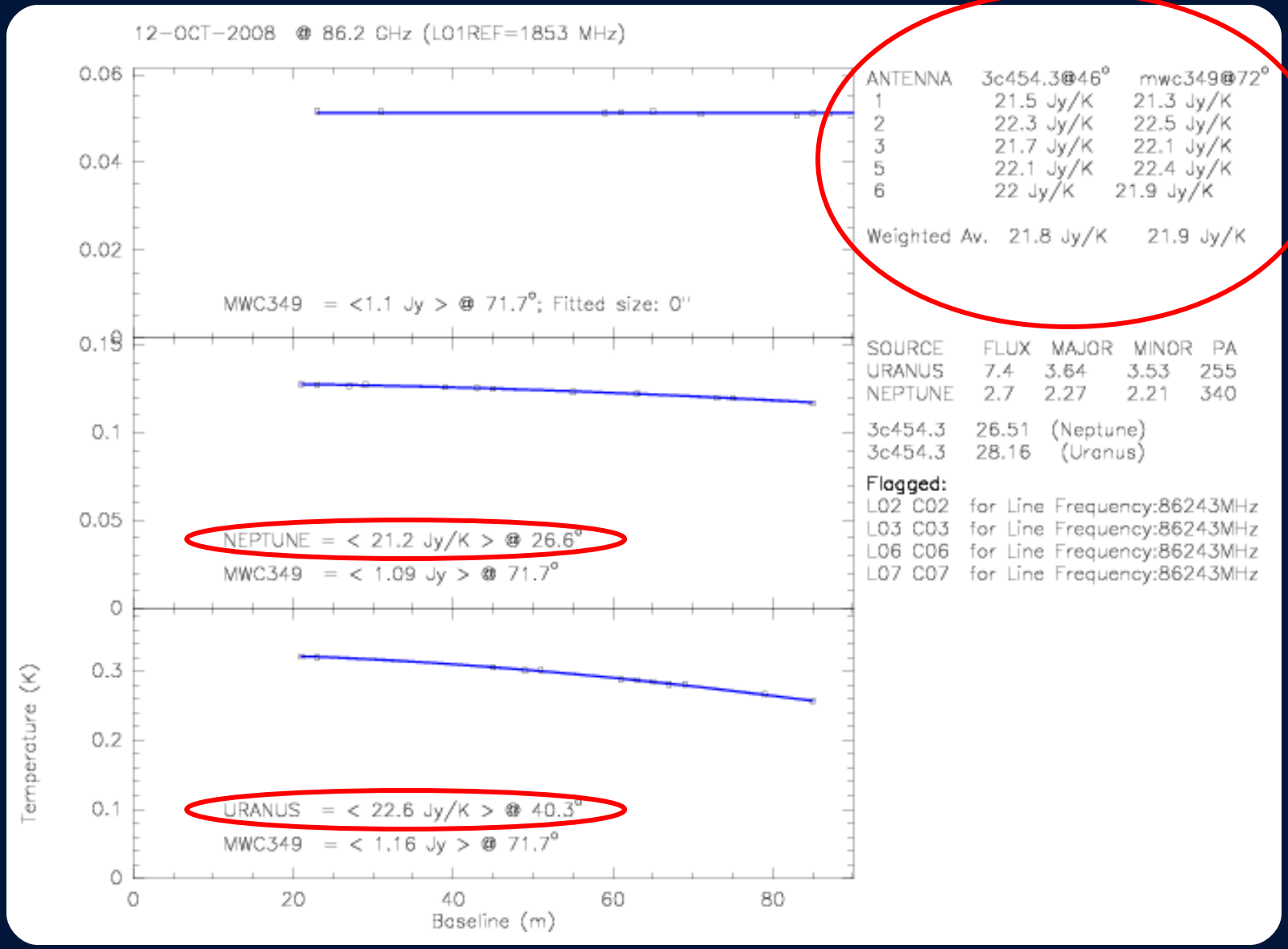
ANTENNA	3c454.3@46°	mwc349@72°
1	21.5 Jy/K	21.3 Jy/K
2	22.3 Jy/K	22.5 Jy/K
3	21.7 Jy/K	22.1 Jy/K
5	22.1 Jy/K	22.4 Jy/K
6	22 Jy/K	21.9 Jy/K
Weighted Av.	21.8 Jy/K	21.9 Jy/K

SOURCE	FLUX	MAJOR	MINOR	PA
URANUS	7.4	3.64	3.53	255
NEPTUNE	2.7	2.27	2.21	340

3c454.3 26.51 (Neptune)
3c454.3 28.16 (Uranus)

Flagged:
L02 C02 for Line Frequency:86243MHz
L03 C03 for Line Frequency:86243MHz
L06 C06 for Line Frequency:86243MHz
L07 C07 for Line Frequency:86243MHz

“By-product” of calibration: getting antenna efficiencies!



ANTENNA	3c454.3@46°	mwc349@72°
1	21.5 Jy/K	21.3 Jy/K
2	22.3 Jy/K	22.5 Jy/K
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Flagged:
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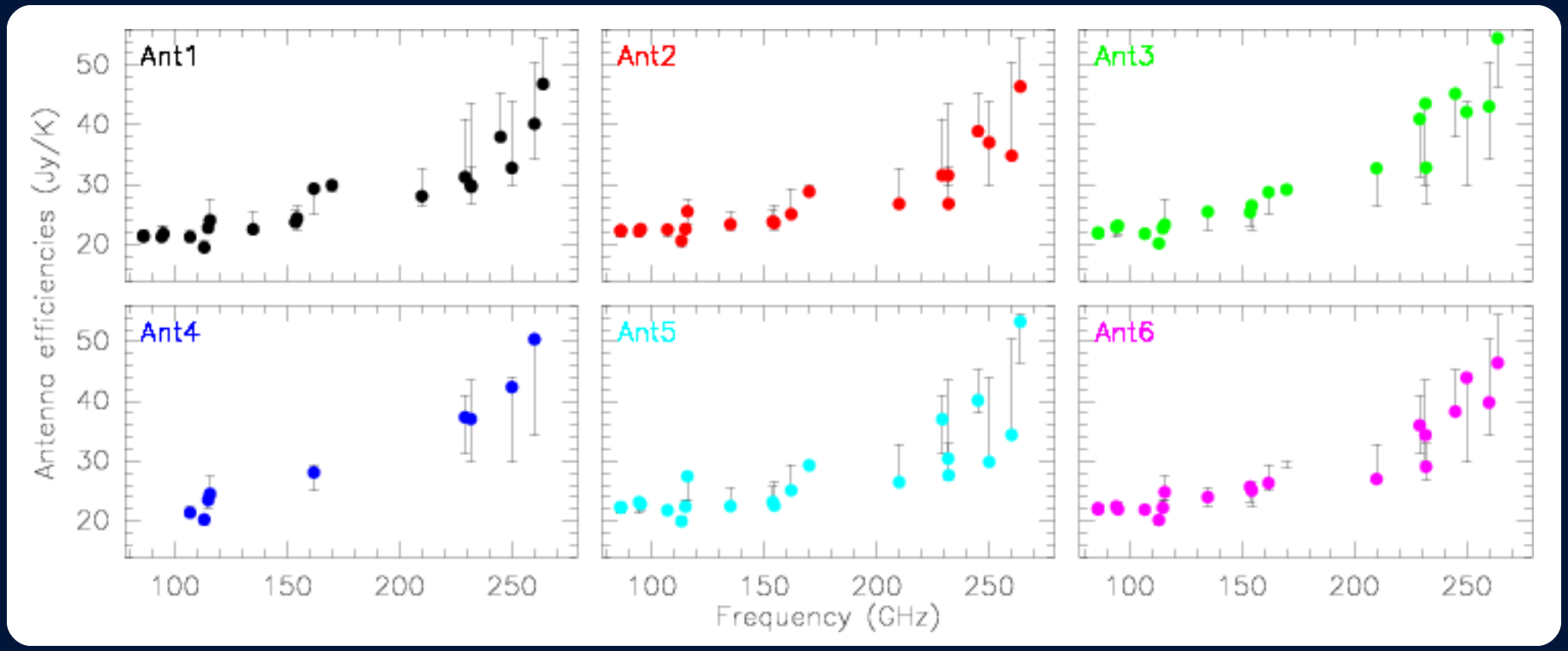
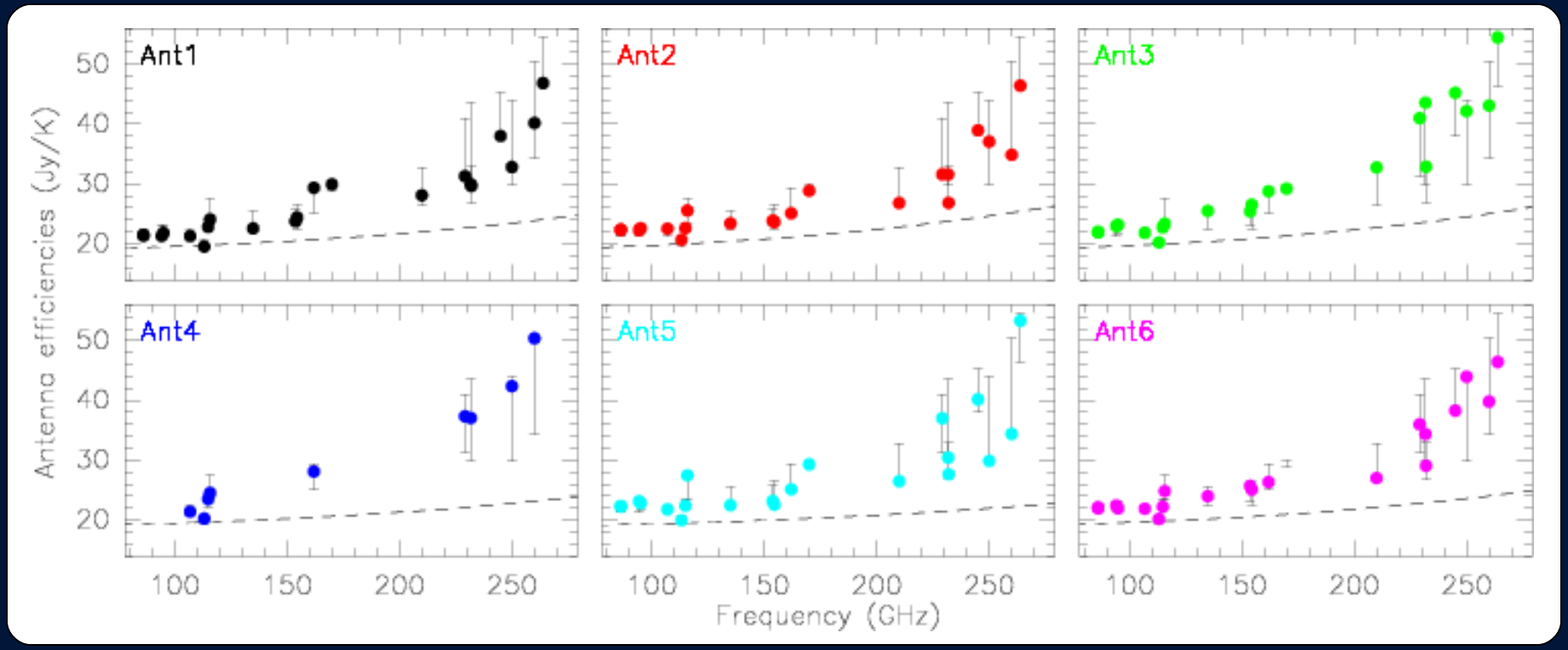
L03 C03 for Line Frequency:86243MHz
L06 C06 for Line Frequency:86243MHz
L07 C07 for Line Frequency:86243MHz

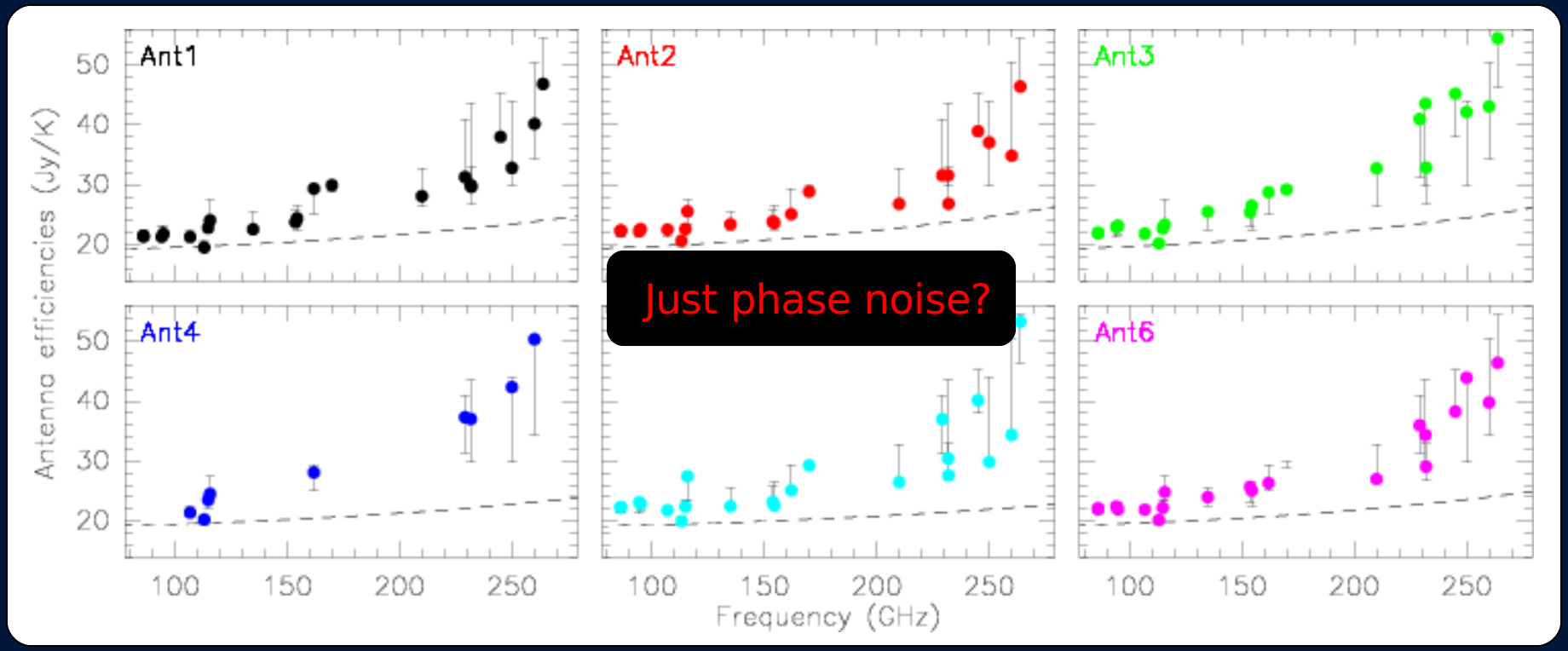
Antenna Efficiencies: Interferometrically



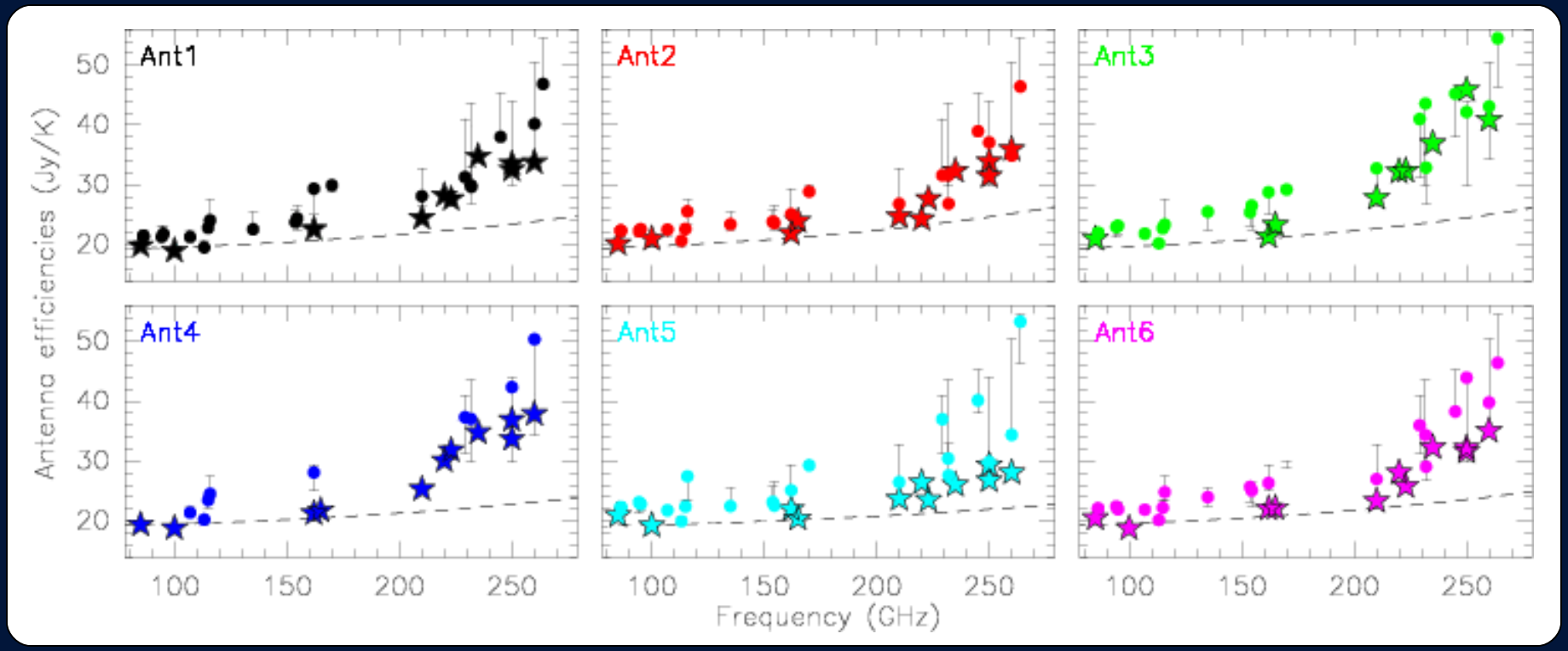
Antenna Efficiencies: Interferometrically + Holo



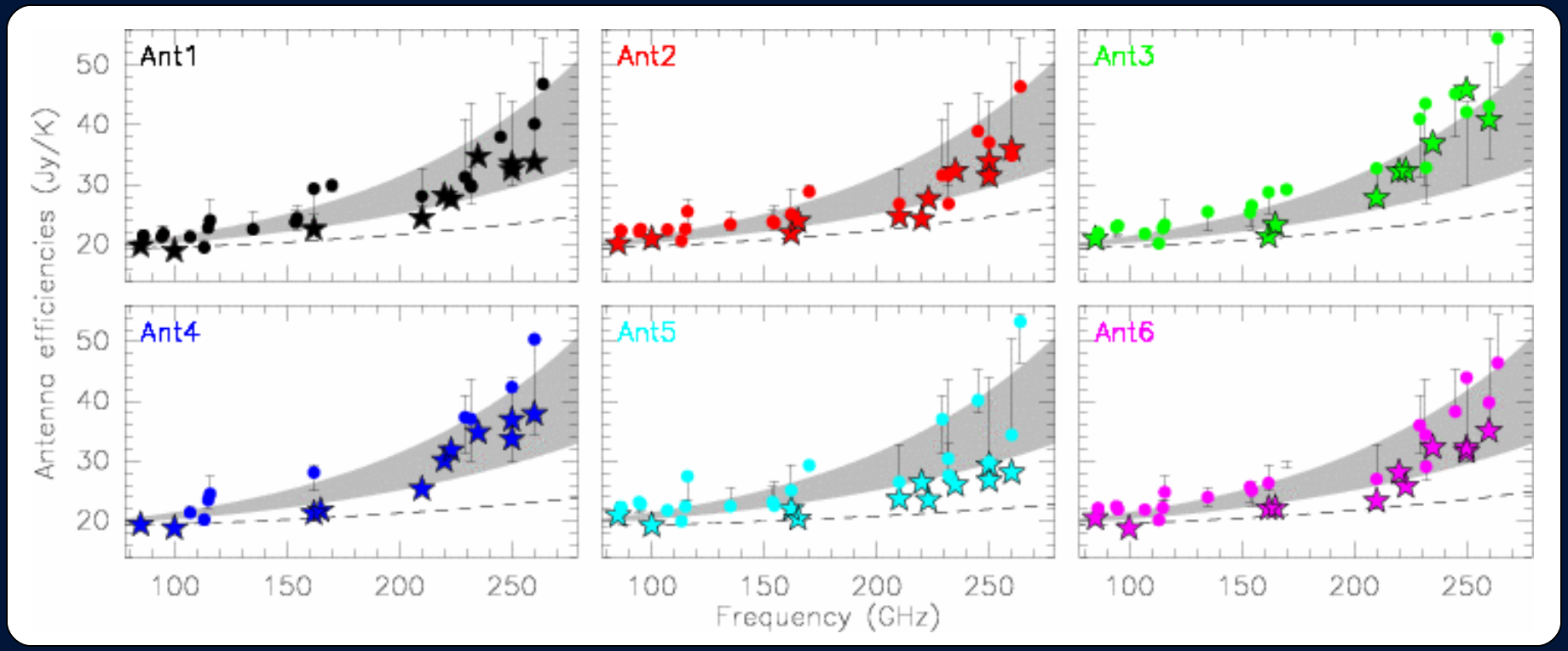
Antenna Efficiencies: Interferometrically + Holo



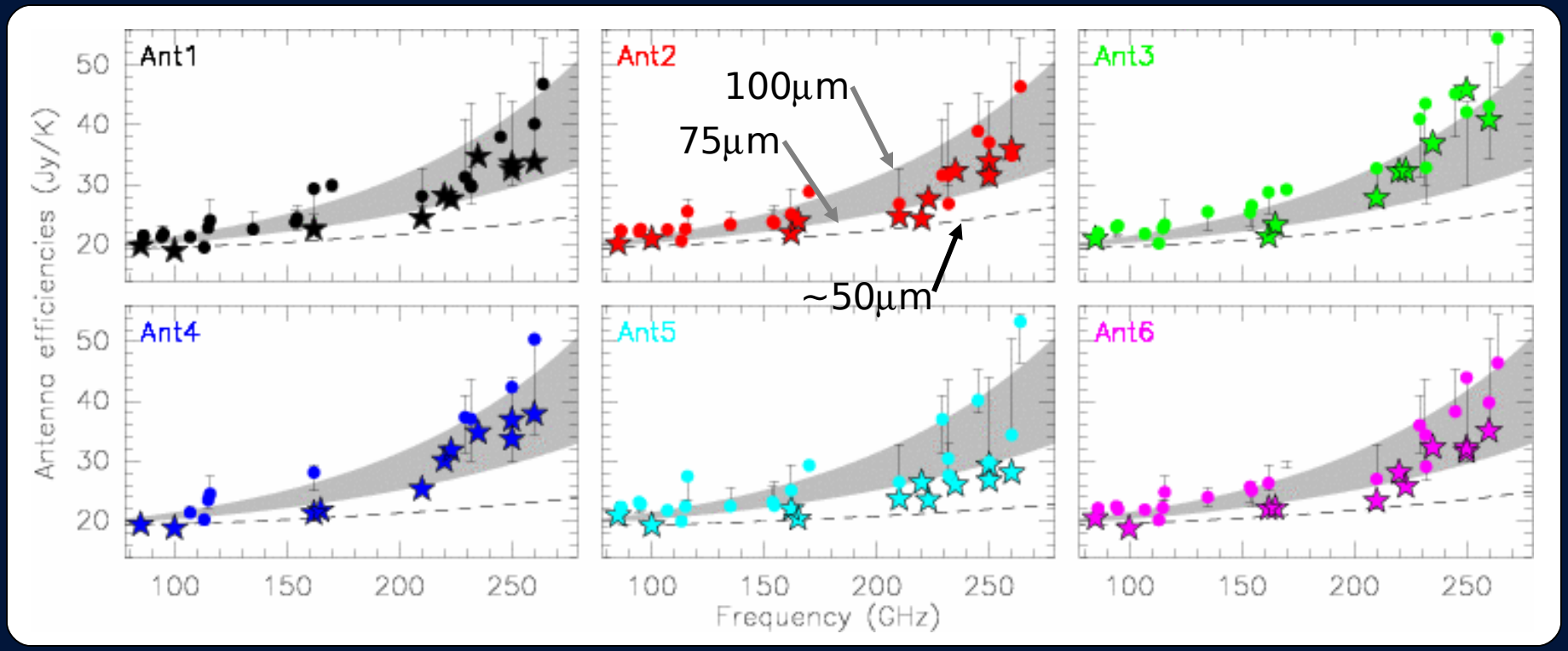
Antenna Efficiencies: Interferometrically + Holo + SD



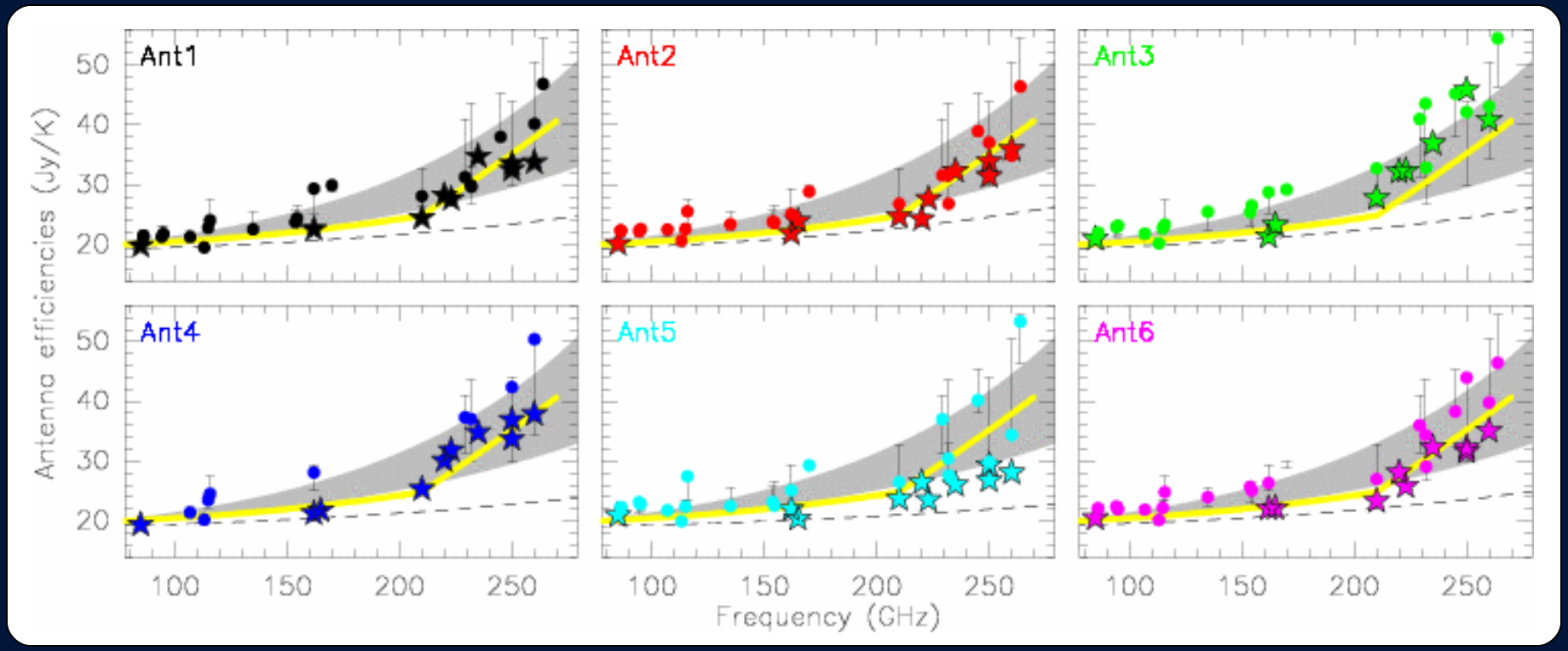
Antenna Efficiencies: Interferometrically + Holo + SD



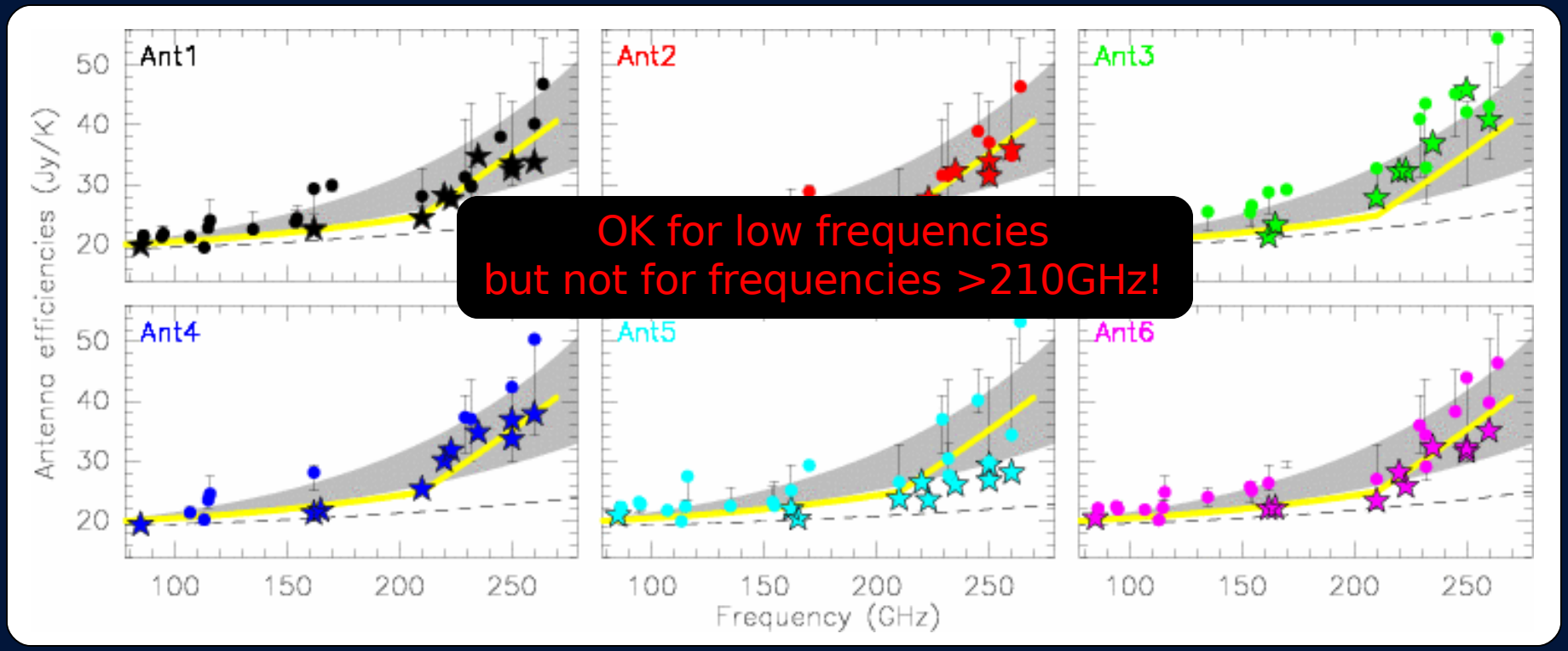
Antenna Efficiencies: Interferometrically + Holo + SD



Antenna Efficiencies: Interferometrically + Holo + SD



Antenna Efficiencies: Interferometrically + Holo + SD

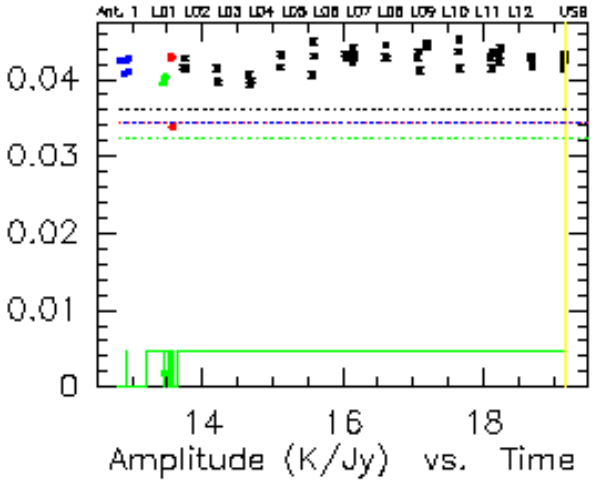


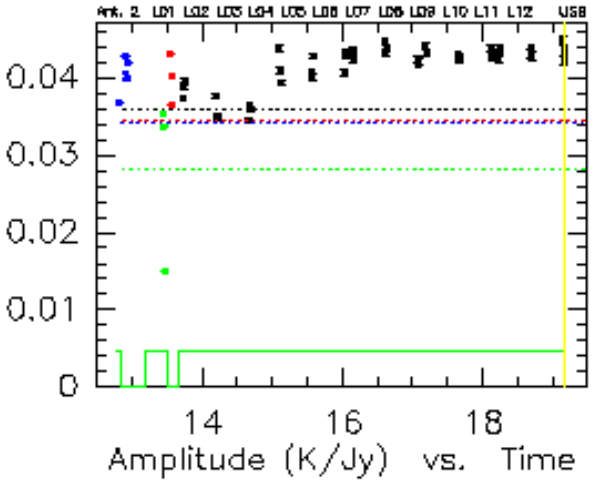
Practical Tips

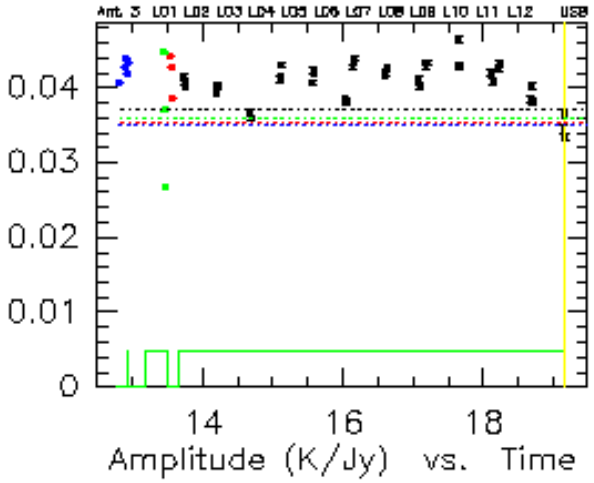
Checklist:

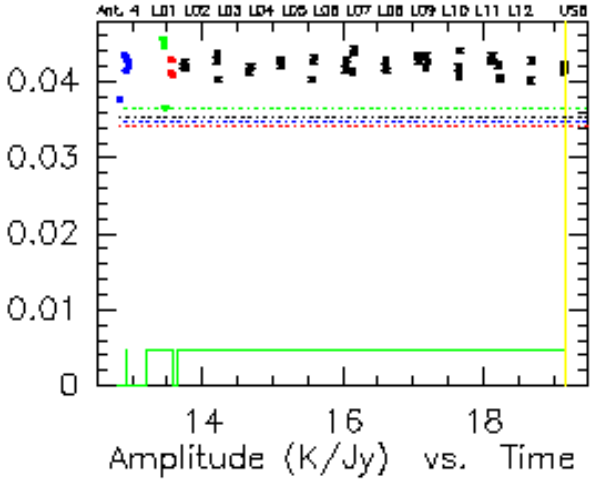
- Antenna Shadowing
- Pointing/Focus Problems
- Tracking Problems
- Do phases of different spectral windows overlap?
- Noisy data
- Has Flux Calibrator Lines?
- Is Flux Calibrator Extended?
- Check Elevation of your source
- Check whether source is polarised (only important when using NC with one polarisation)

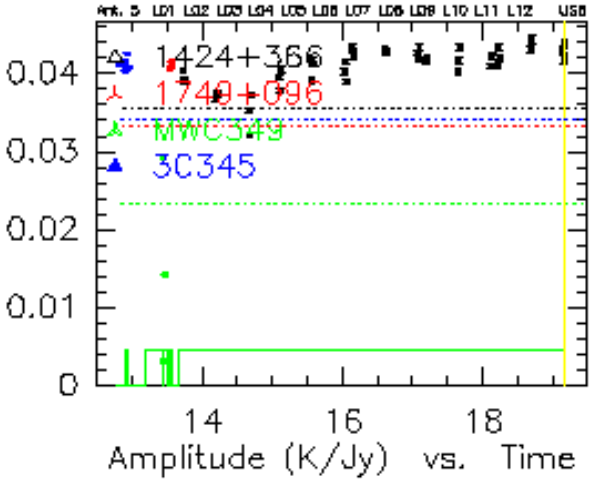
Practical Tips



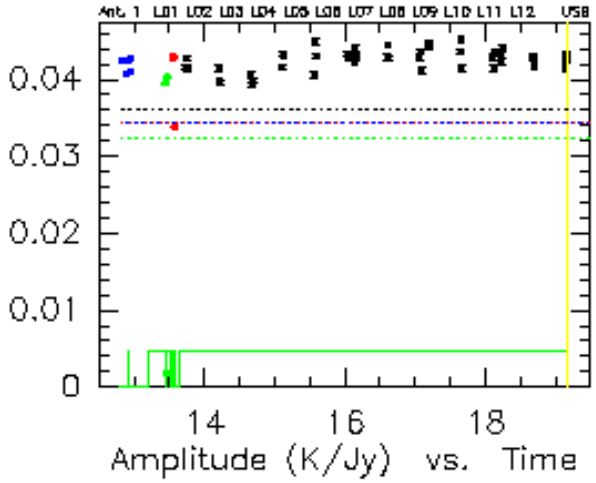


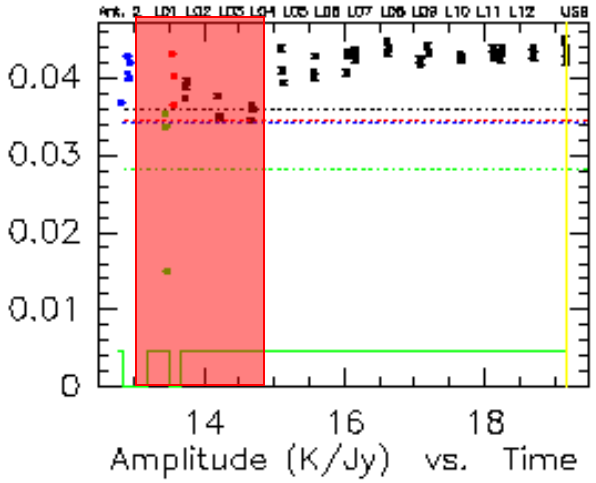


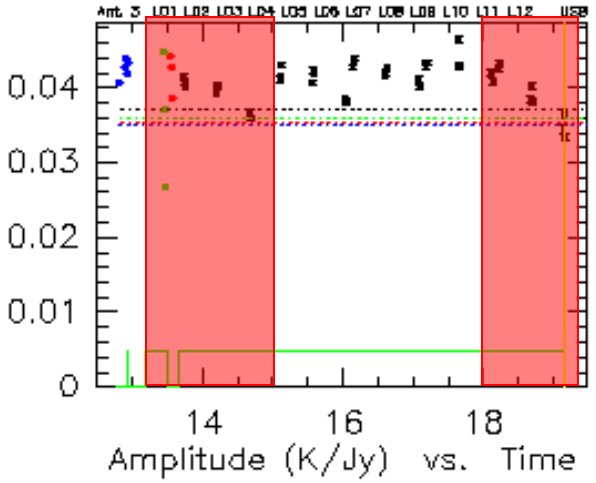


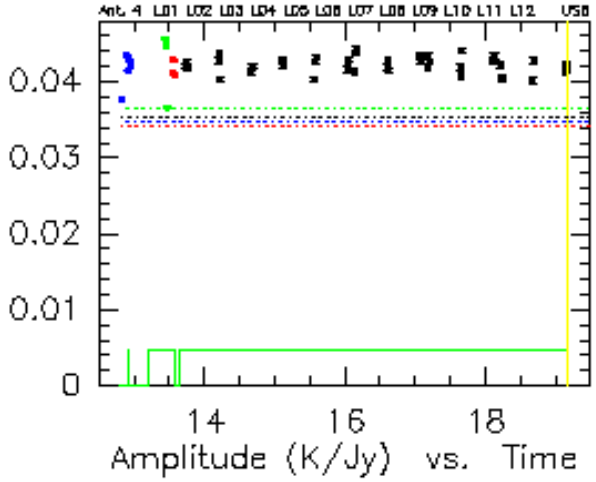


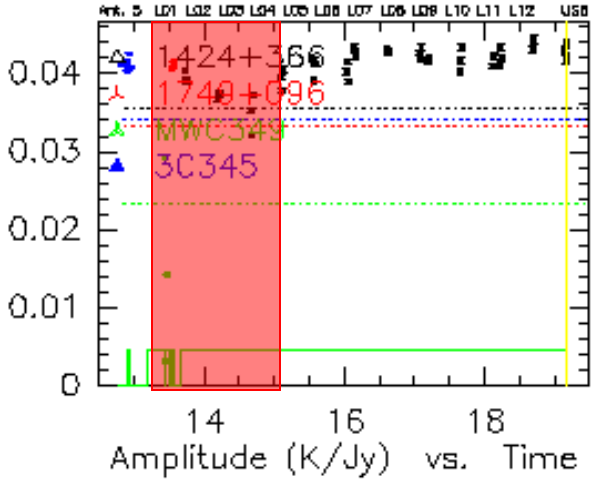
Practical Tips





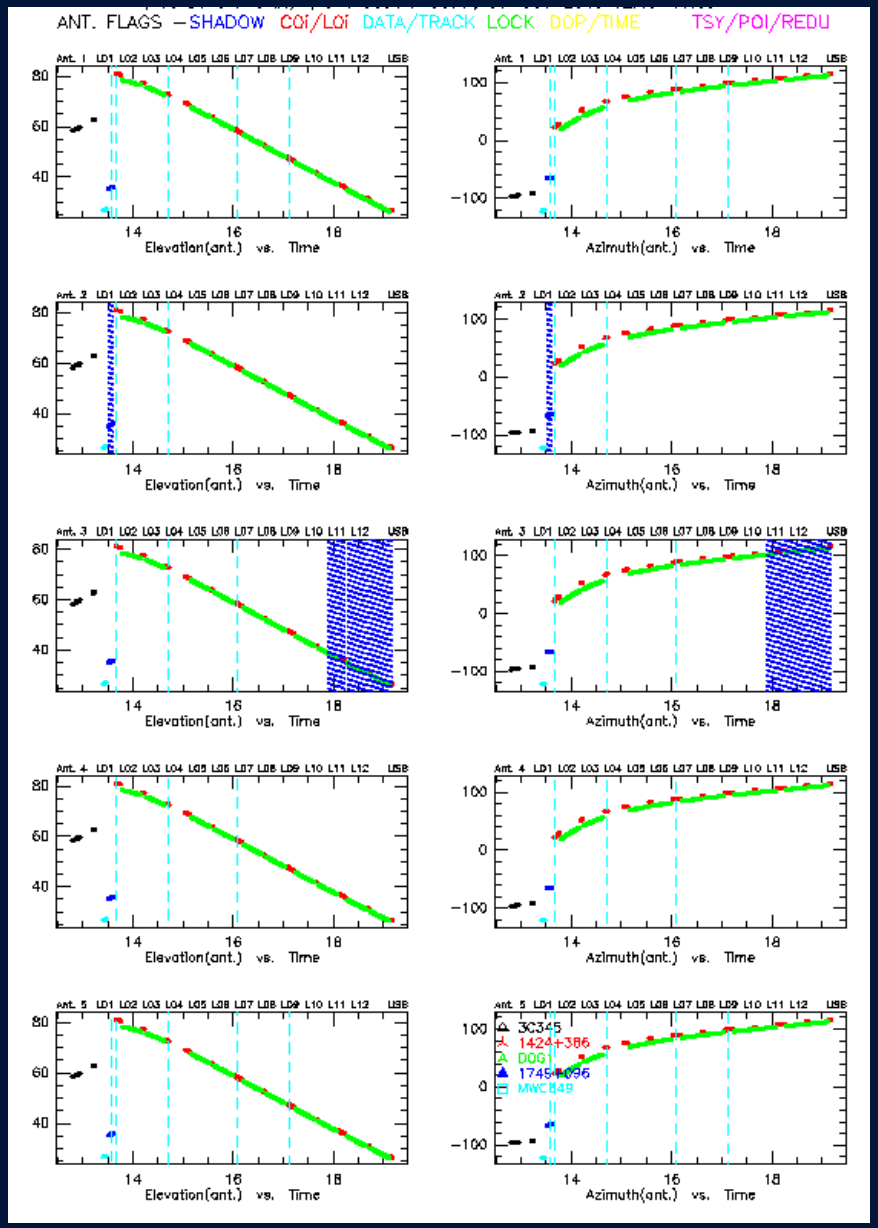




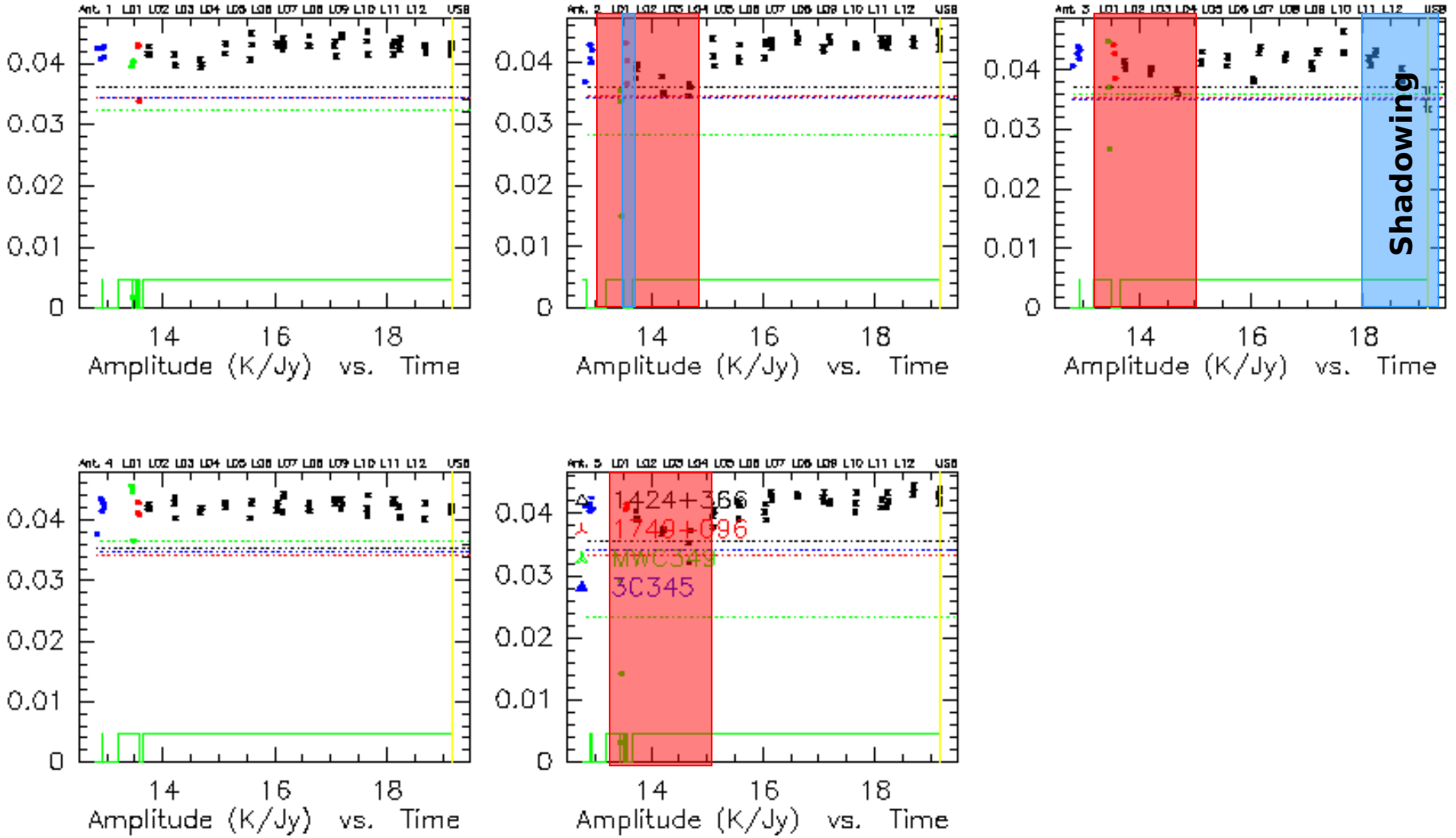


Practical Tips: Shadowing

First Look

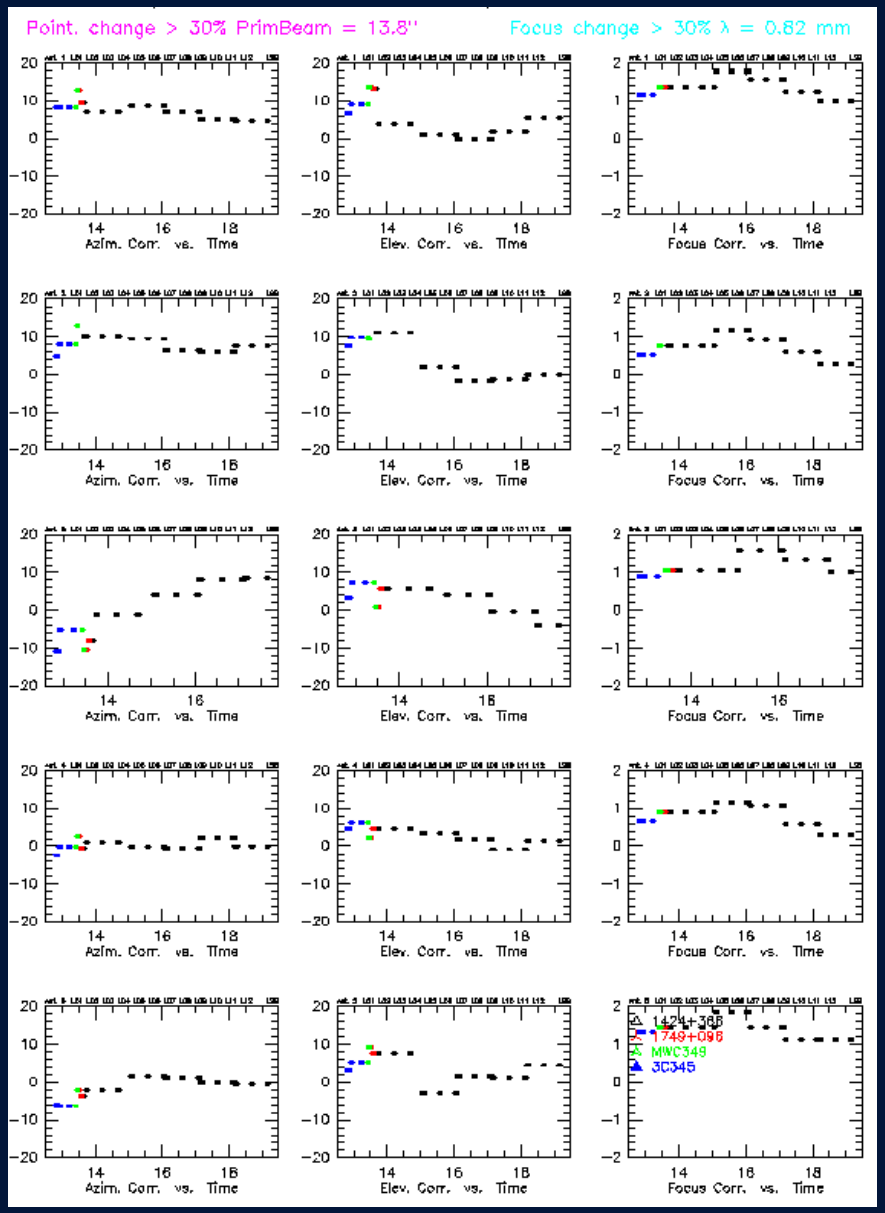


Practical Tips: Shadowing



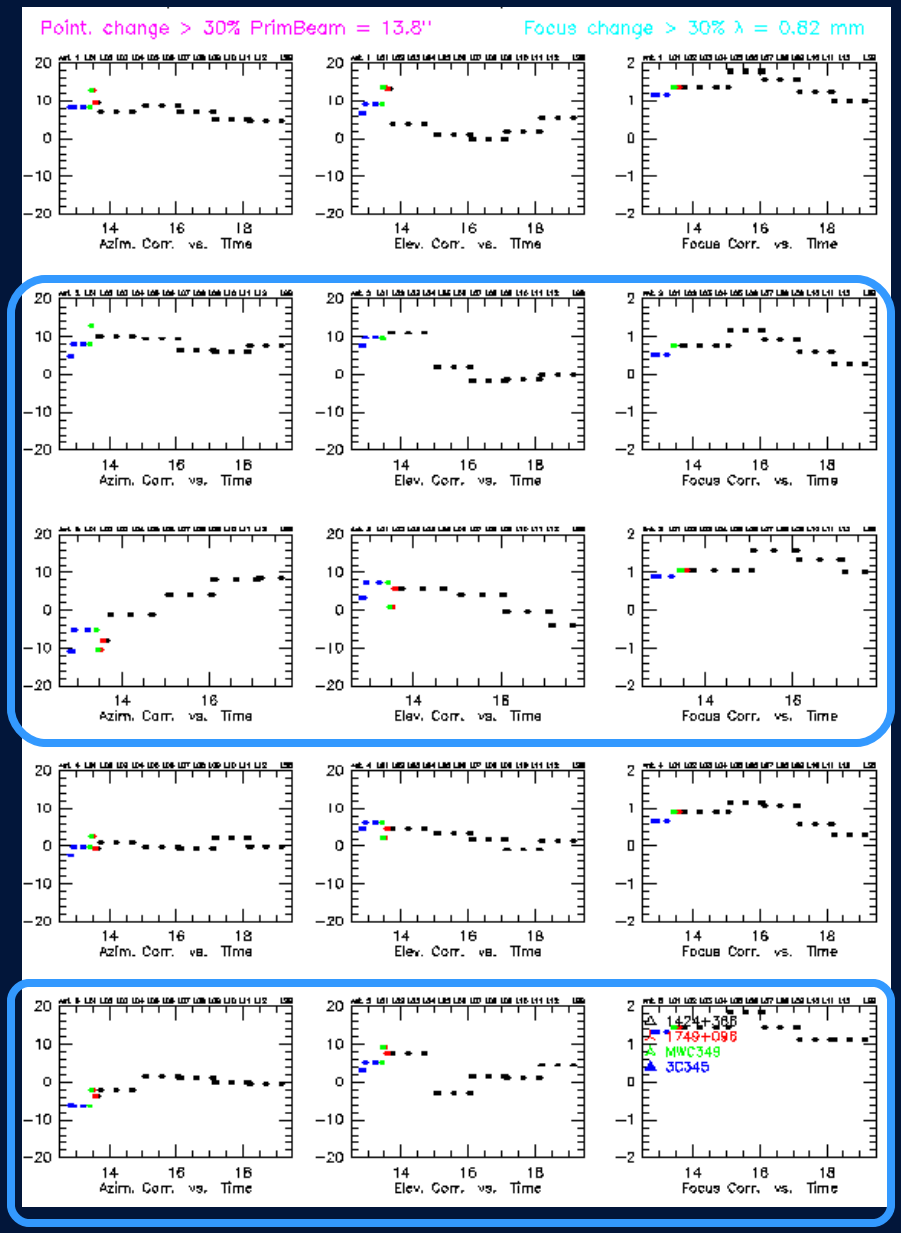
Practical Tips: Pointing/Focus

First Look



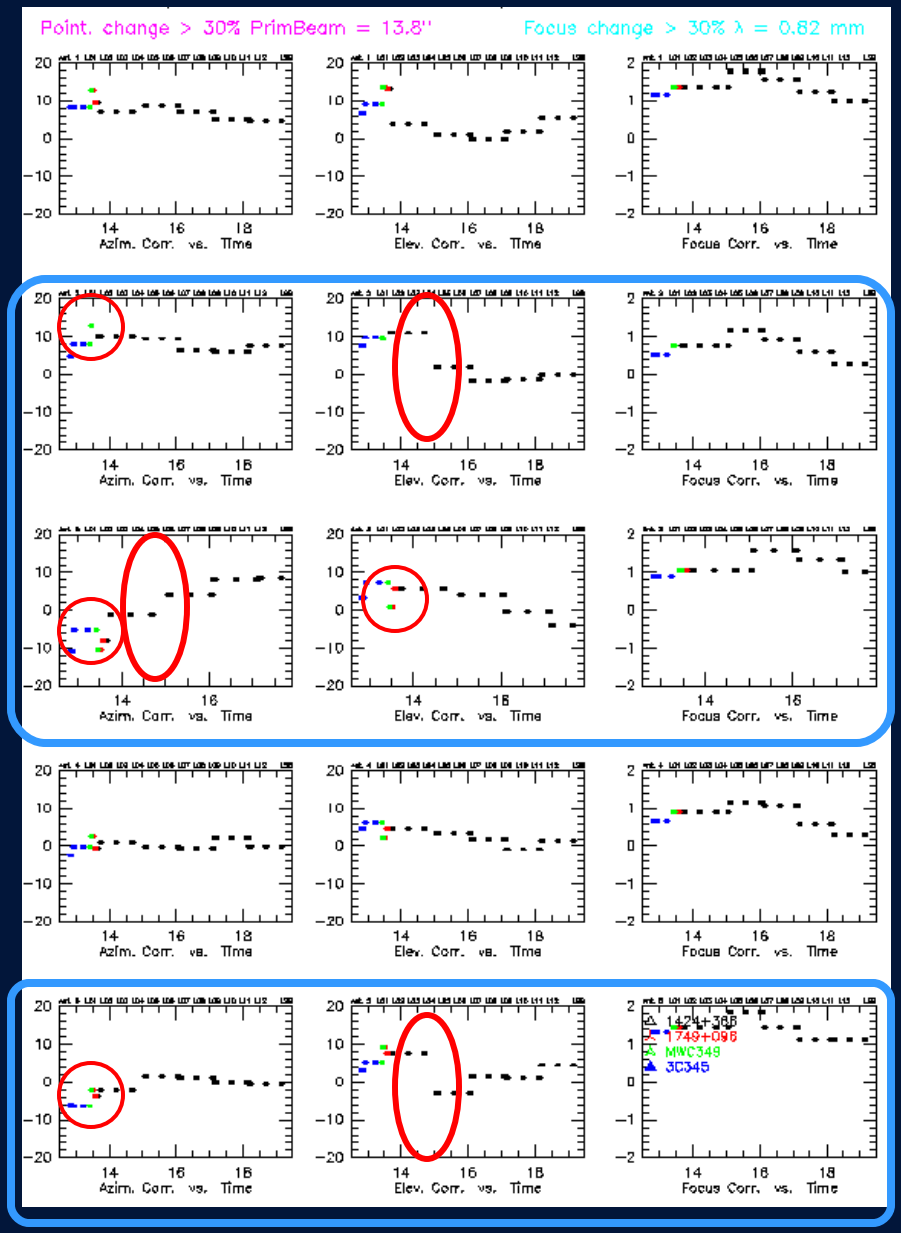
Practical Tips : Pointing/Focus

First Look



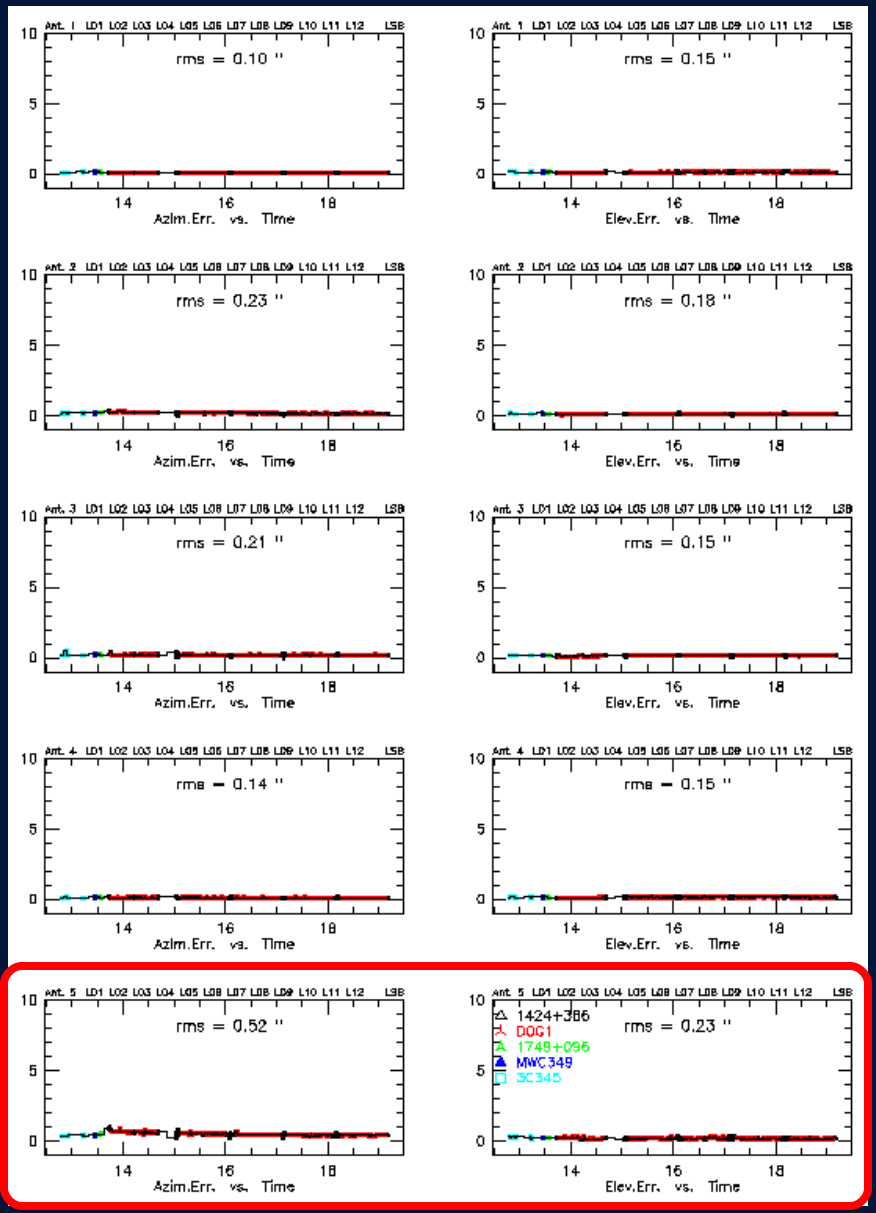
Practical Tips : Pointing/Focus

First Look

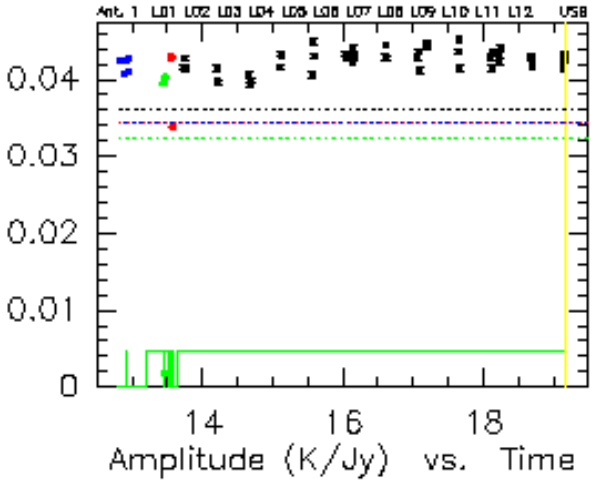


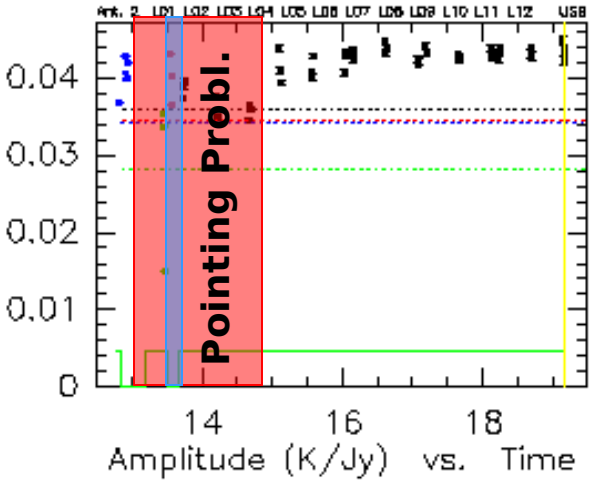
Practical Tips: Tracking

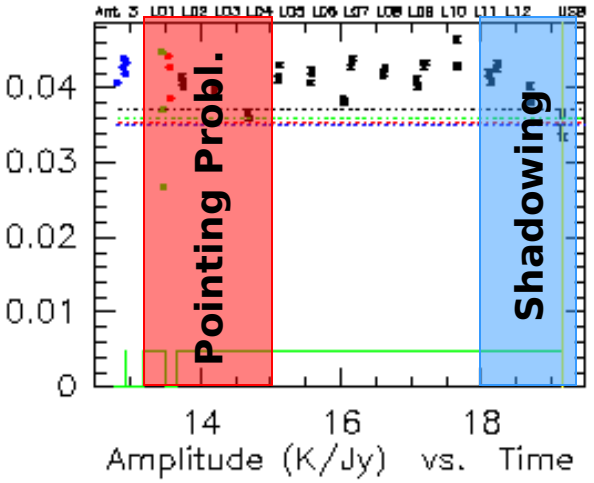
First Look

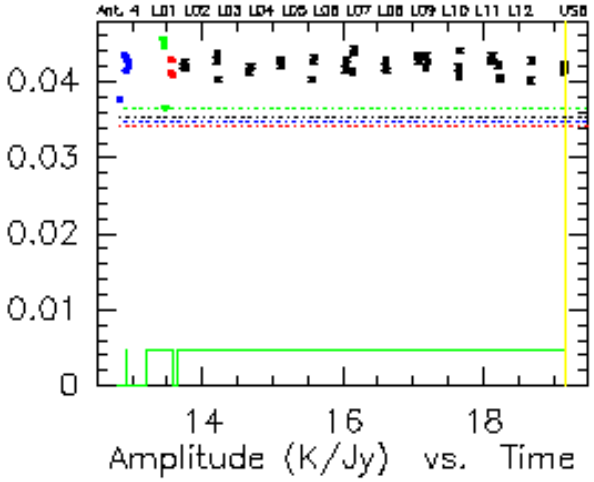


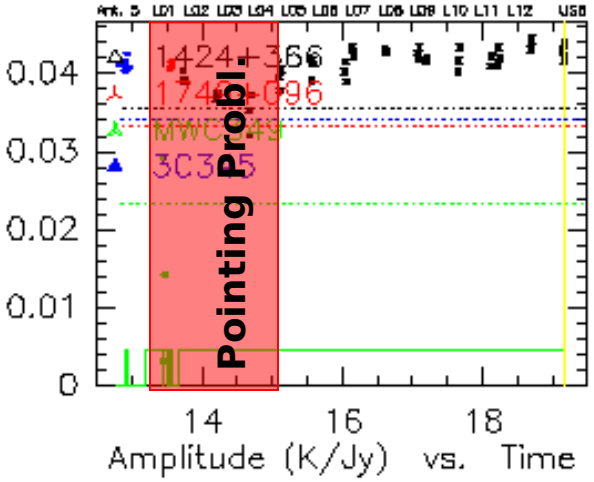
Practical Tips



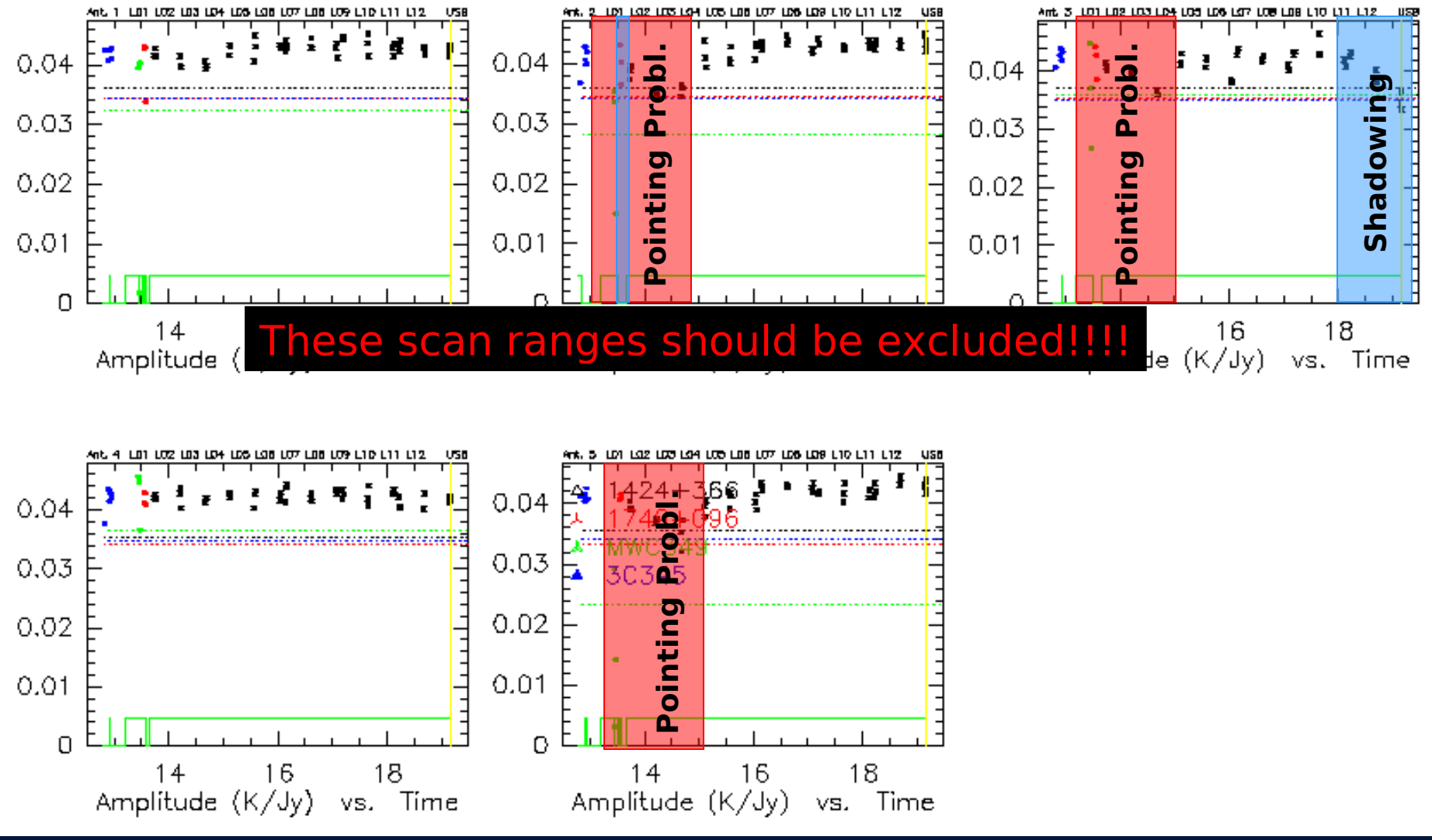




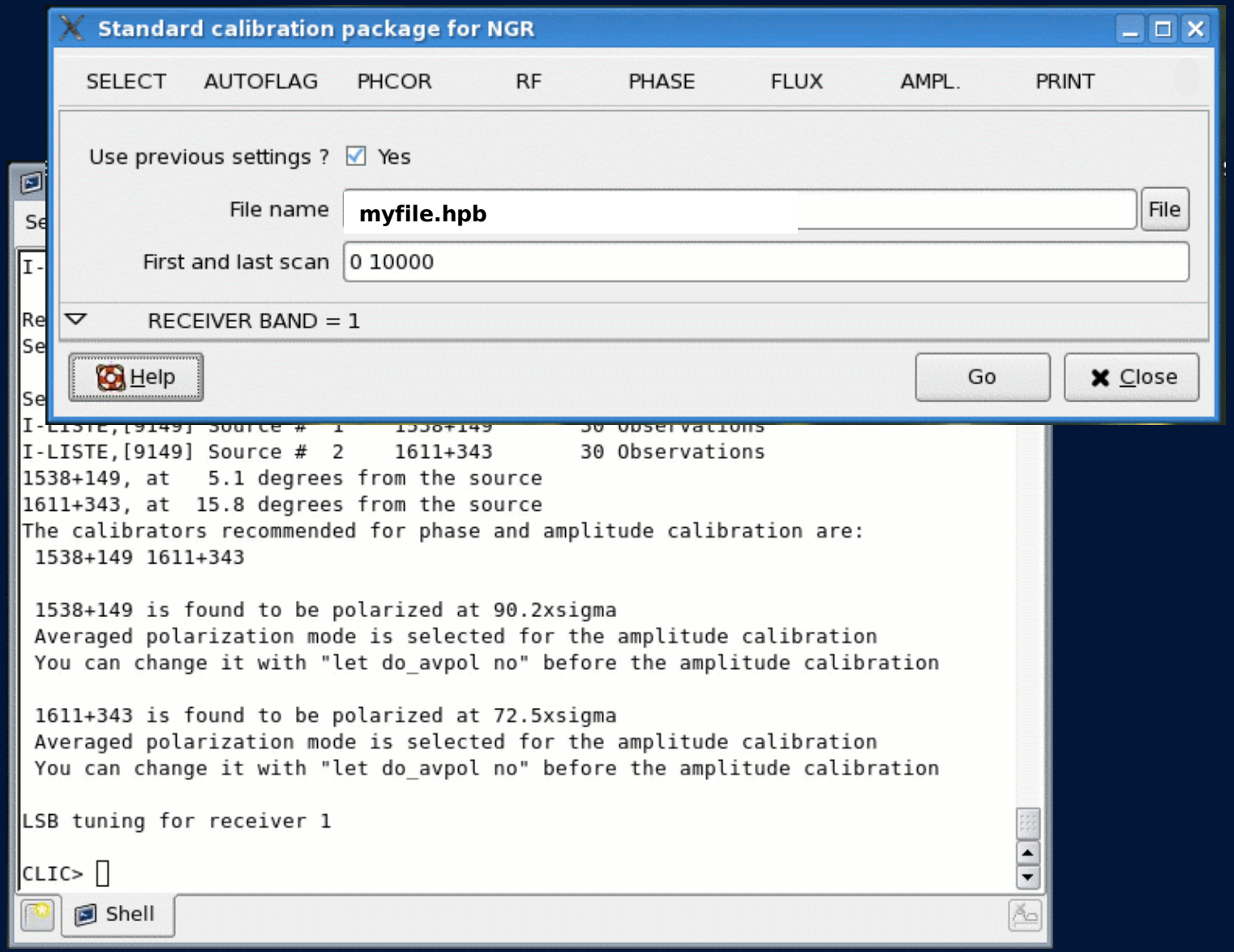




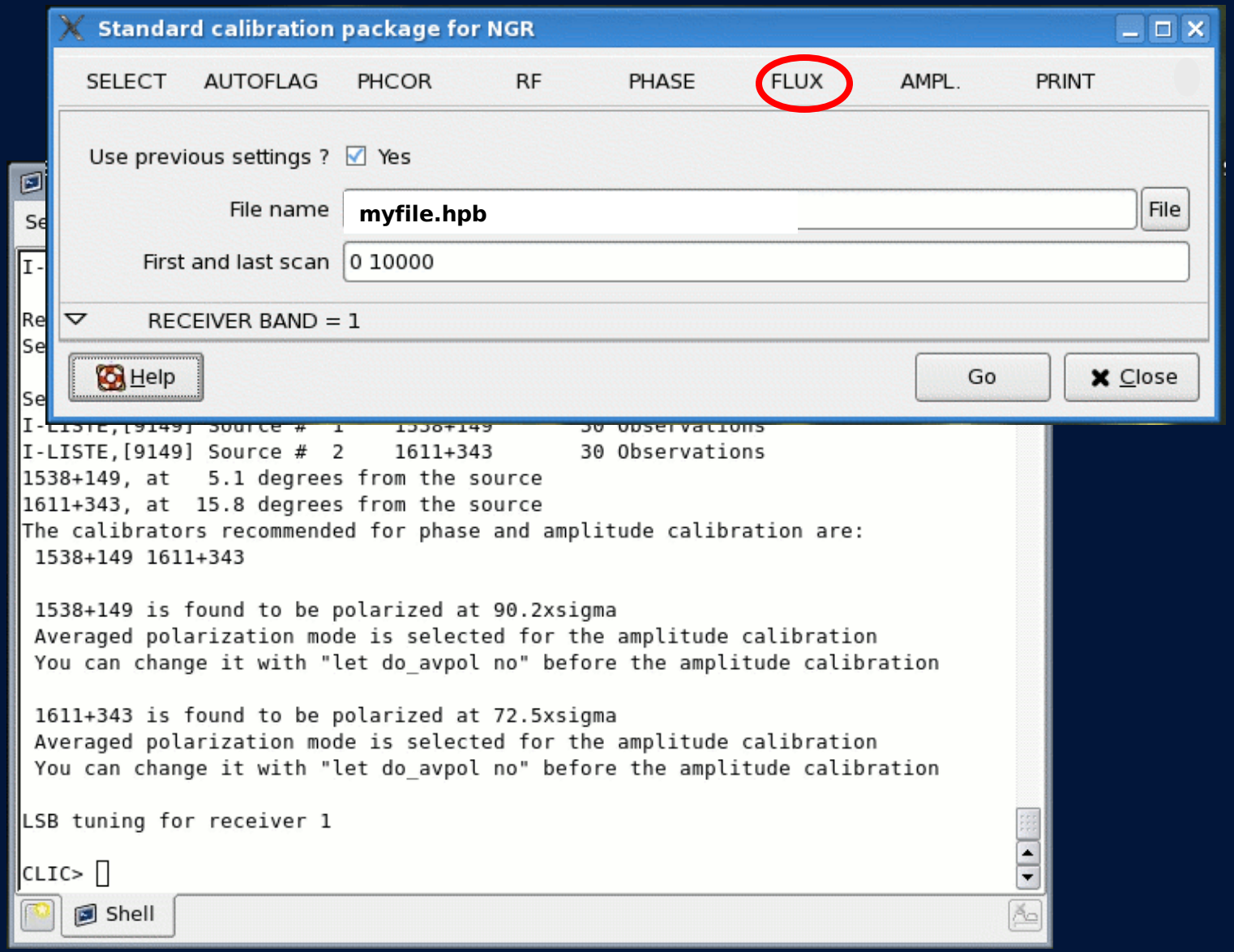
Practical Tips



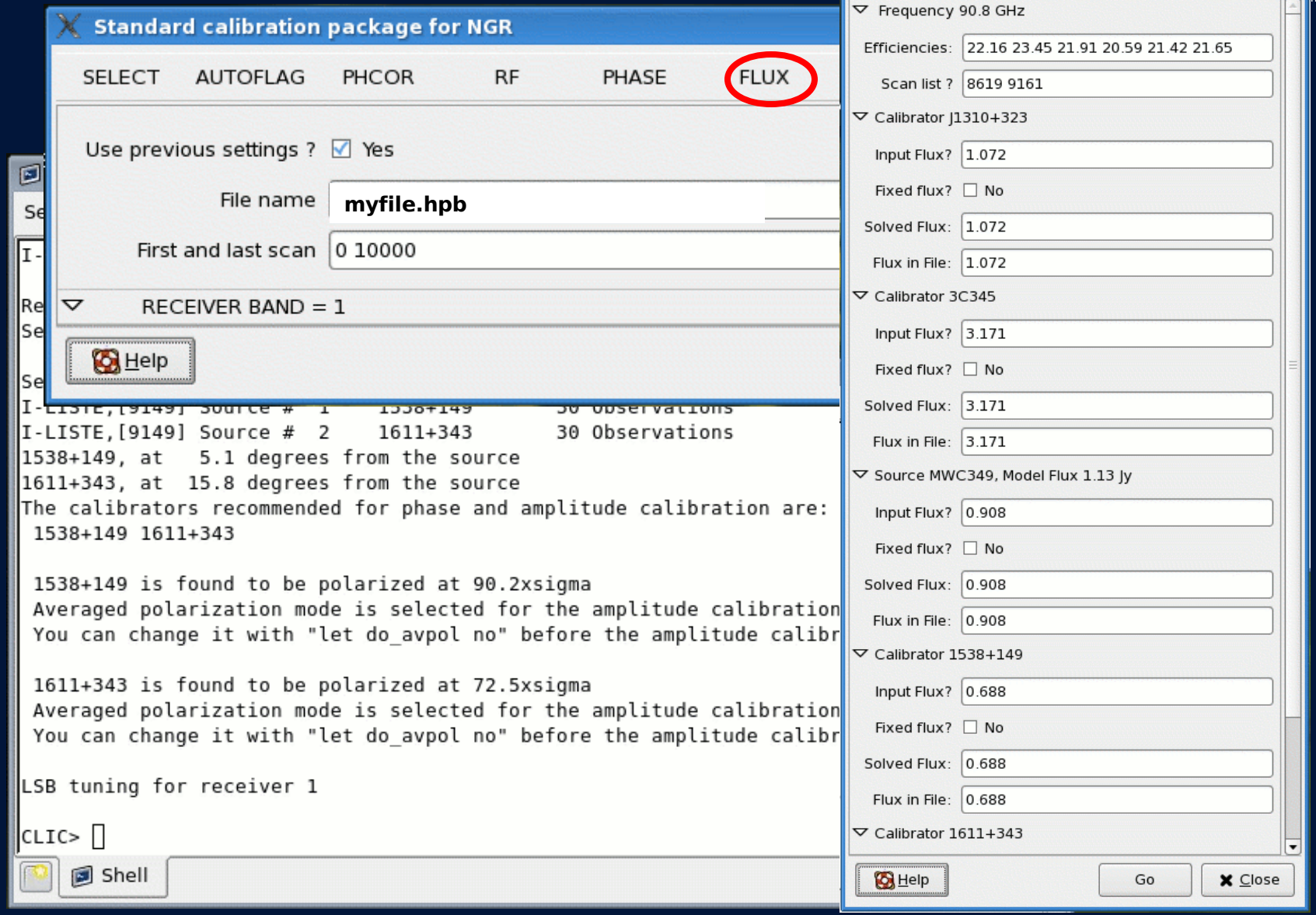
Motivation


Standard calibration package for NGR
SELECT
AUTOFLAG
PHCOR
RF
PHASE
FLUX
AMPL.
PRINT
Use previous settings ?
Yes
File name
myfile.hpb
File
First and last scan
0 10000
RECEIVER BAND = 1
Help
Go
Close
I-LISTE,[9149] Source # 2 1611+343 30 Observations
1538+149, at 5.1 degrees from the source
1611+343, at 15.8 degrees from the source
The calibrators recommended for phase and amplitude calibration are:
1538+149 1611+343
1538+149 is found to be polarized at 90.2xsigma
Averaged polarization mode is selected for the amplitude calibration
You can change it with "let do_avpol no" before the amplitude calibration
1611+343 is found to be polarized at 72.5xsigma
Averaged polarization mode is selected for the amplitude calibration
You can change it with "let do_avpol no" before the amplitude calibration
LSB tuning for receiver 1
CLIC>
Shell

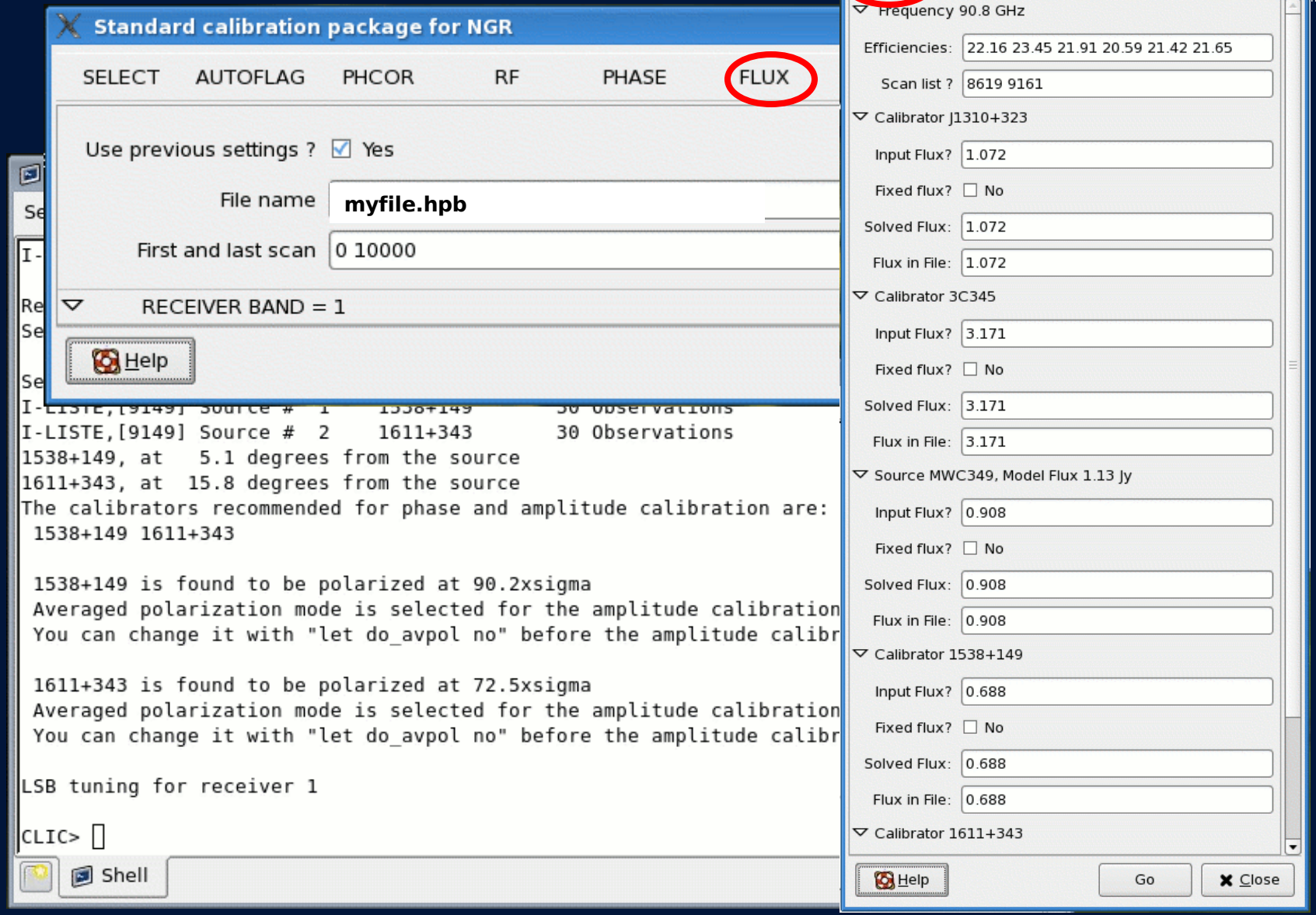
Motivation


Standard calibration package for NGR
SELECT
AUTOFLAG
PHCOR
RF
PHASE
FLUX
AMPL.
PRINT
Use previous settings ?
Yes
File name
myfile.hpb
File
First and last scan
0 10000
RECEIVER BAND = 1
Help
Go
Close
I-LISTE,[9149] Source # 2 1611+343 30 Observations
1538+149, at 5.1 degrees from the source
1611+343, at 15.8 degrees from the source
The calibrators recommended for phase and amplitude calibration are:
1538+149 1611+343
1538+149 is found to be polarized at 90.2xsigma
Averaged polarization mode is selected for the amplitude calibration
You can change it with "let do_avpol no" before the amplitude calibration
1611+343 is found to be polarized at 72.5xsigma
Averaged polarization mode is selected for the amplitude calibration
You can change it with "let do_avpol no" before the amplitude calibration
LSB tuning for receiver 1
CLIC>
Shell

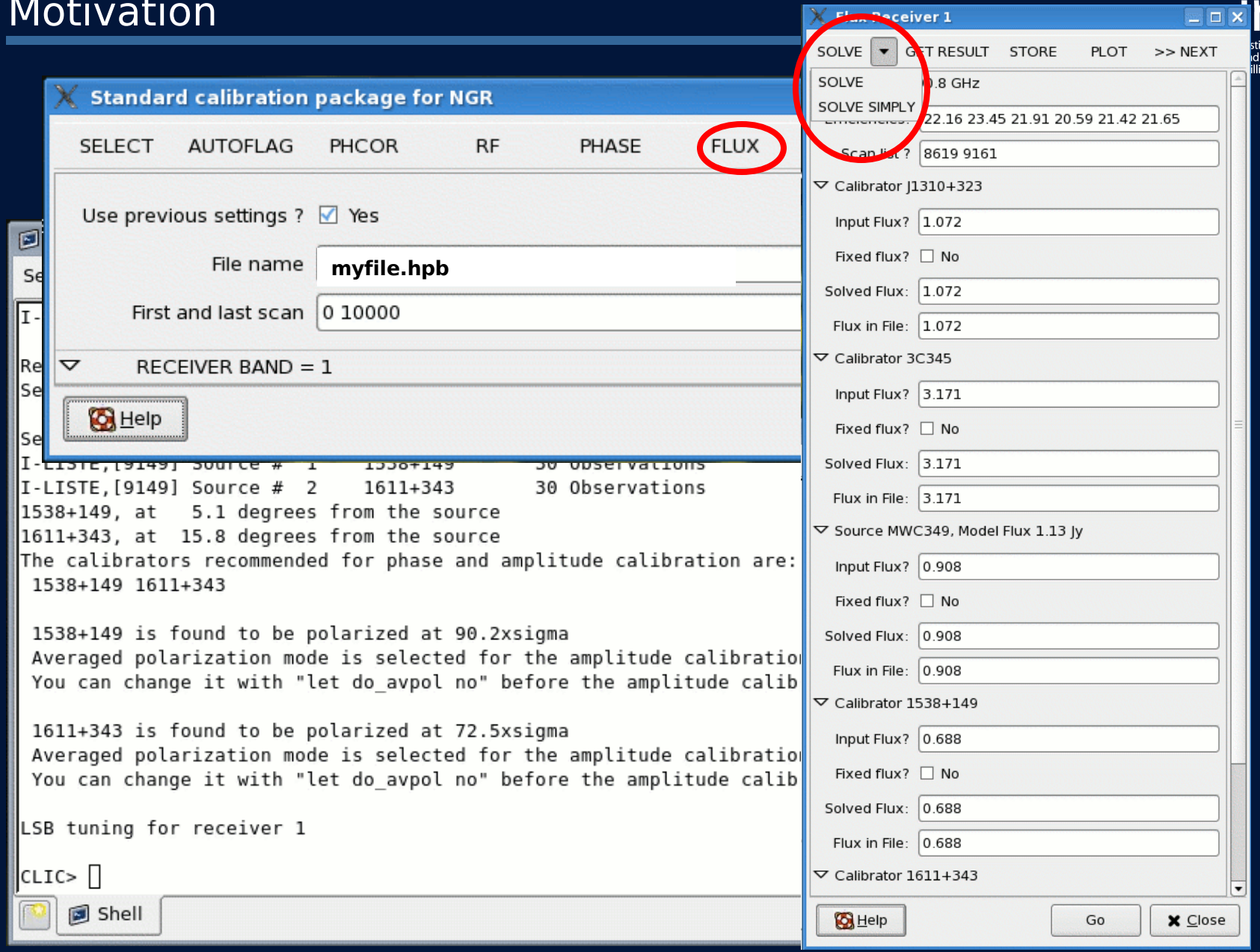
Motivation


Standard calibration package for NGR
SELECT
AUTOFLAG
PHCOR
RF
PHASE
FLUX
Use previous settings ?
Yes
File name
myfile.hpb
First and last scan
0 10000
RECEIVER BAND = 1
Help
I-LISTE,[9149] Source # 2 1611+343 30 Observations
1538+149, at 5.1 degrees from the source
1611+343, at 15.8 degrees from the source
The calibrators recommended for phase and amplitude calibration are:
1538+149 1611+343
1538+149 is found to be polarized at 90.2xsigma
Averaged polarization mode is selected for the amplitude calibration
You can change it with "let do_avpol no" before the amplitude calibr
1611+343 is found to be polarized at 72.5xsigma
Averaged polarization mode is selected for the amplitude calibration
You can change it with "let do_avpol no" before the amplitude calibr
LSB tuning for receiver 1
CLIC>
Shell
Flux Receiver 1
SOLVE
GET RESULT
STORE
PLOT
>> NEXT
Frequency 90.8 GHz
Efficiencies: 22.16 23.45 21.91 20.59 21.42 21.65
Scan list ? 8619 9161
Calibrator J1310+323
Input Flux? 1.072
Fixed flux? No
Solved Flux: 1.072
Flux in File: 1.072
Calibrator 3C345
Input Flux? 3.171
Fixed flux? No
Solved Flux: 3.171
Flux in File: 3.171
Source MWC349, Model Flux 1.13 Jy
Input Flux? 0.908
Fixed flux? No
Solved Flux: 0.908
Flux in File: 0.908
Calibrator 1538+149
Input Flux? 0.688
Fixed flux? No
Solved Flux: 0.688
Flux in File: 0.688
Calibrator 1611+343
Help
Go
Close

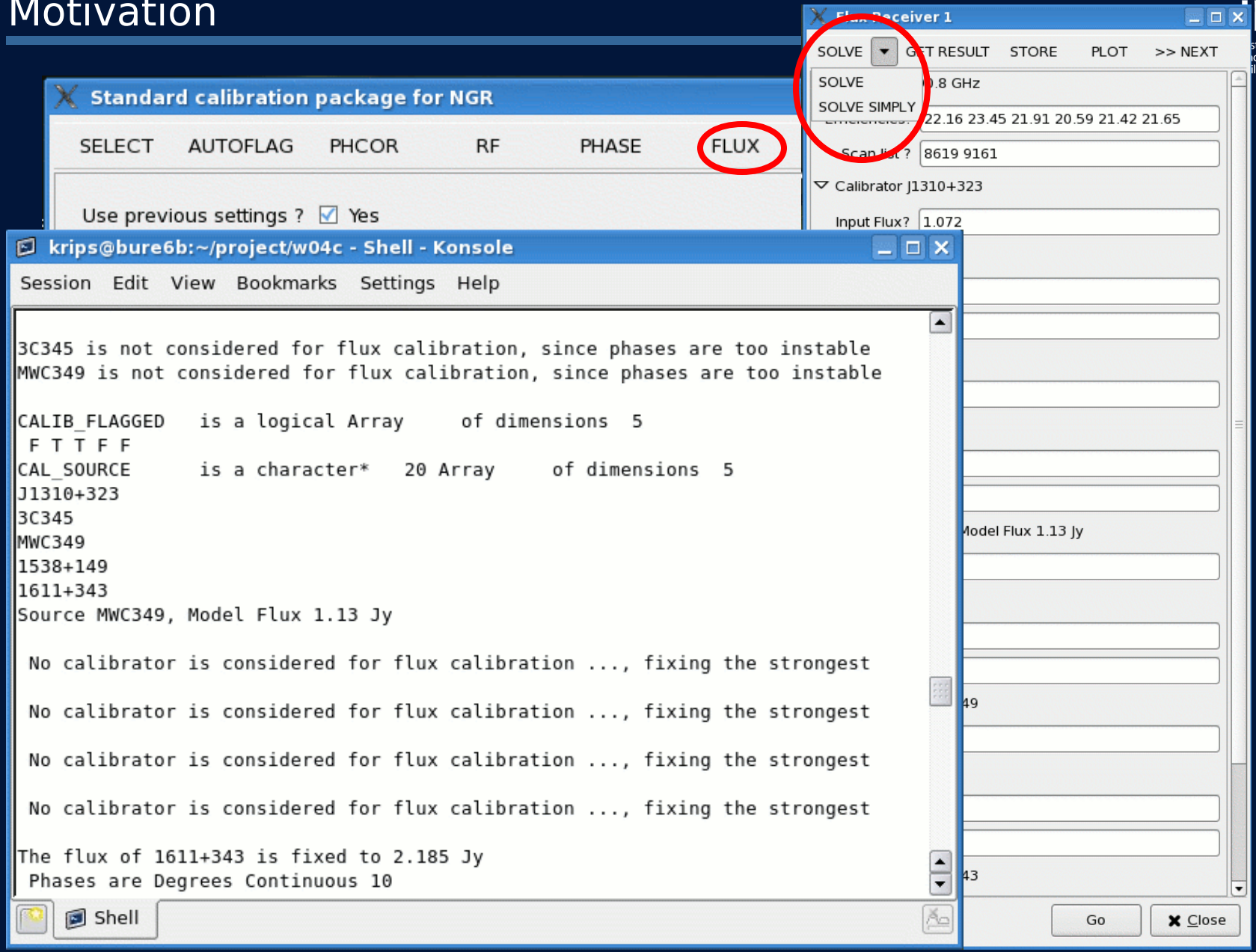
Motivation


Standard calibration package for NGR
SELECT
AUTOFLAG
PHCOR
RF
PHASE
FLUX
Use previous settings ?
Yes
File name
myfile.hpb
First and last scan
0 10000
RECEIVER BAND = 1
Help
I-LISTE,[9149] Source # 2 1611+343 30 Observations
1538+149, at 5.1 degrees from the source
1611+343, at 15.8 degrees from the source
The calibrators recommended for phase and amplitude calibration are:
1538+149 1611+343
1538+149 is found to be polarized at 90.2xsigma
Averaged polarization mode is selected for the amplitude calibration
You can change it with "let do_avpol no" before the amplitude calibr
1611+343 is found to be polarized at 72.5xsigma
Averaged polarization mode is selected for the amplitude calibration
You can change it with "let do_avpol no" before the amplitude calibr
LSB tuning for receiver 1
CLIC>
Shell
Flux Receiver 1
SOLVE
GET RESULT
STORE
PLOT
>> NEXT
Frequency 90.8 GHz
Efficiencies: 22.16 23.45 21.91 20.59 21.42 21.65
Scan list ? 8619 9161
Calibrator J1310+323
Input Flux? 1.072
Fixed flux? No
Solved Flux: 1.072
Flux in File: 1.072
Calibrator 3C345
Input Flux? 3.171
Fixed flux? No
Solved Flux: 3.171
Flux in File: 3.171
Source MWC349, Model Flux 1.13 Jy
Input Flux? 0.908
Fixed flux? No
Solved Flux: 0.908
Flux in File: 0.908
Calibrator 1538+149
Input Flux? 0.688
Fixed flux? No
Solved Flux: 0.688
Flux in File: 0.688
Calibrator 1611+343
Help
Go
Close

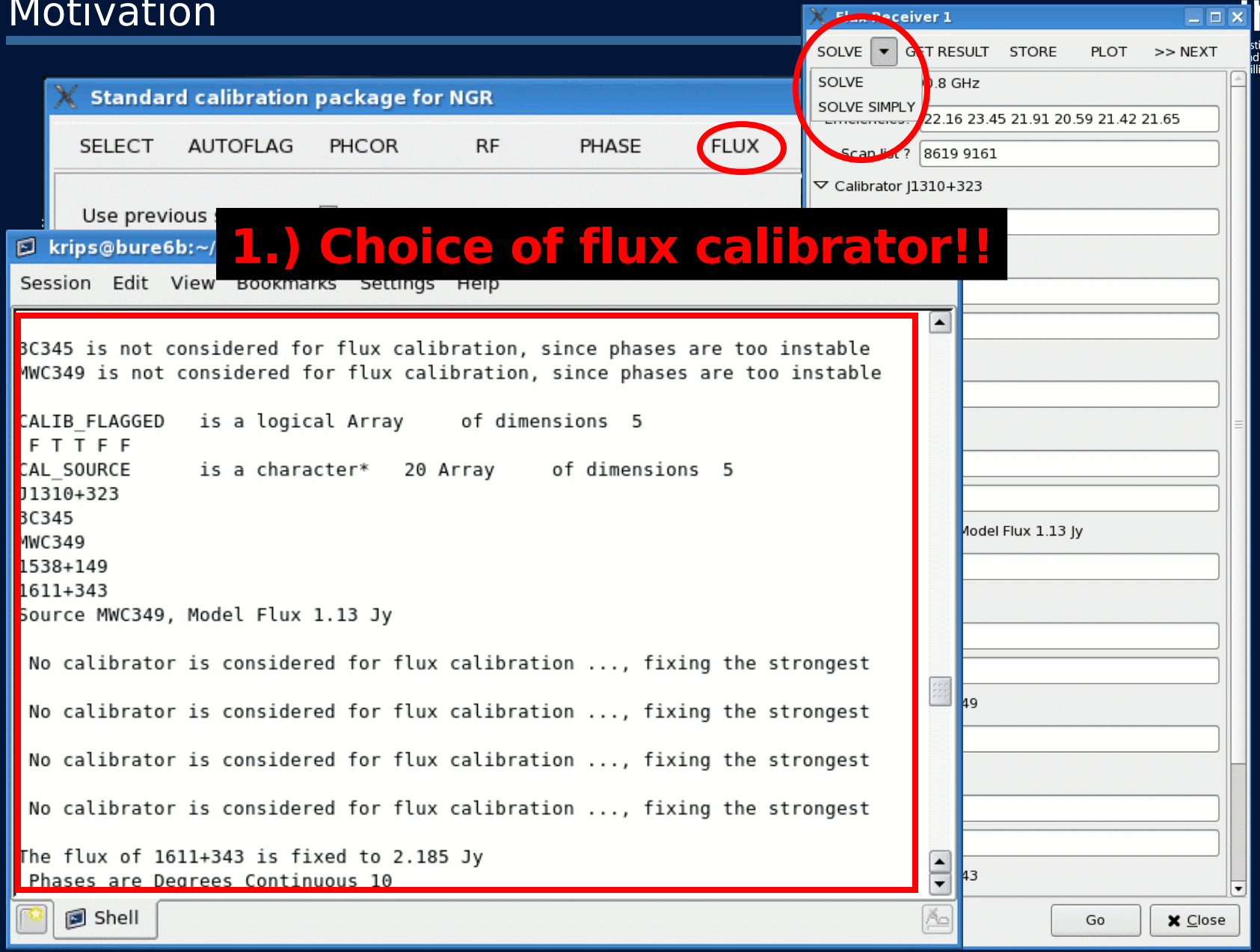
Motivation


Standard calibration package for NGR
SELECT
AUTOFLAG
PHCOR
RF
PHASE
FLUX
Use previous settings ?
Yes
File name
myfile.hpb
First and last scan
0 10000
RECEIVER BAND = 1
Help
I-LISTE,[9149] Source # 2 1611+343 30 Observations
1538+149, at 5.1 degrees from the source
1611+343, at 15.8 degrees from the source
The calibrators recommended for phase and amplitude calibration are:
1538+149 1611+343
1538+149 is found to be polarized at 90.2xsigma
Averaged polarization mode is selected for the amplitude calibratio
You can change it with "let do_avpol no" before the amplitude calib
1611+343 is found to be polarized at 72.5xsigma
Averaged polarization mode is selected for the amplitude calibratio
You can change it with "let do_avpol no" before the amplitude calib
LSB tuning for receiver 1
CLIC>
Shell
SOLVE
GET RESULT
STORE
PLOT
>> NEXT
SOLVE
SOLVE SIMPLY
8619 9161
Calibrator J1310+323
Input Flux? 1.072
Fixed flux? No
Solved Flux: 1.072
Flux in File: 1.072
Calibrator 3C345
Input Flux? 3.171
Fixed flux? No
Solved Flux: 3.171
Flux in File: 3.171
Source MWC349, Model Flux 1.13 Jy
Input Flux? 0.908
Fixed flux? No
Solved Flux: 0.908
Flux in File: 0.908
Calibrator 1538+149
Input Flux? 0.688
Fixed flux? No
Solved Flux: 0.688
Flux in File: 0.688
Calibrator 1611+343
Help
Go
Close

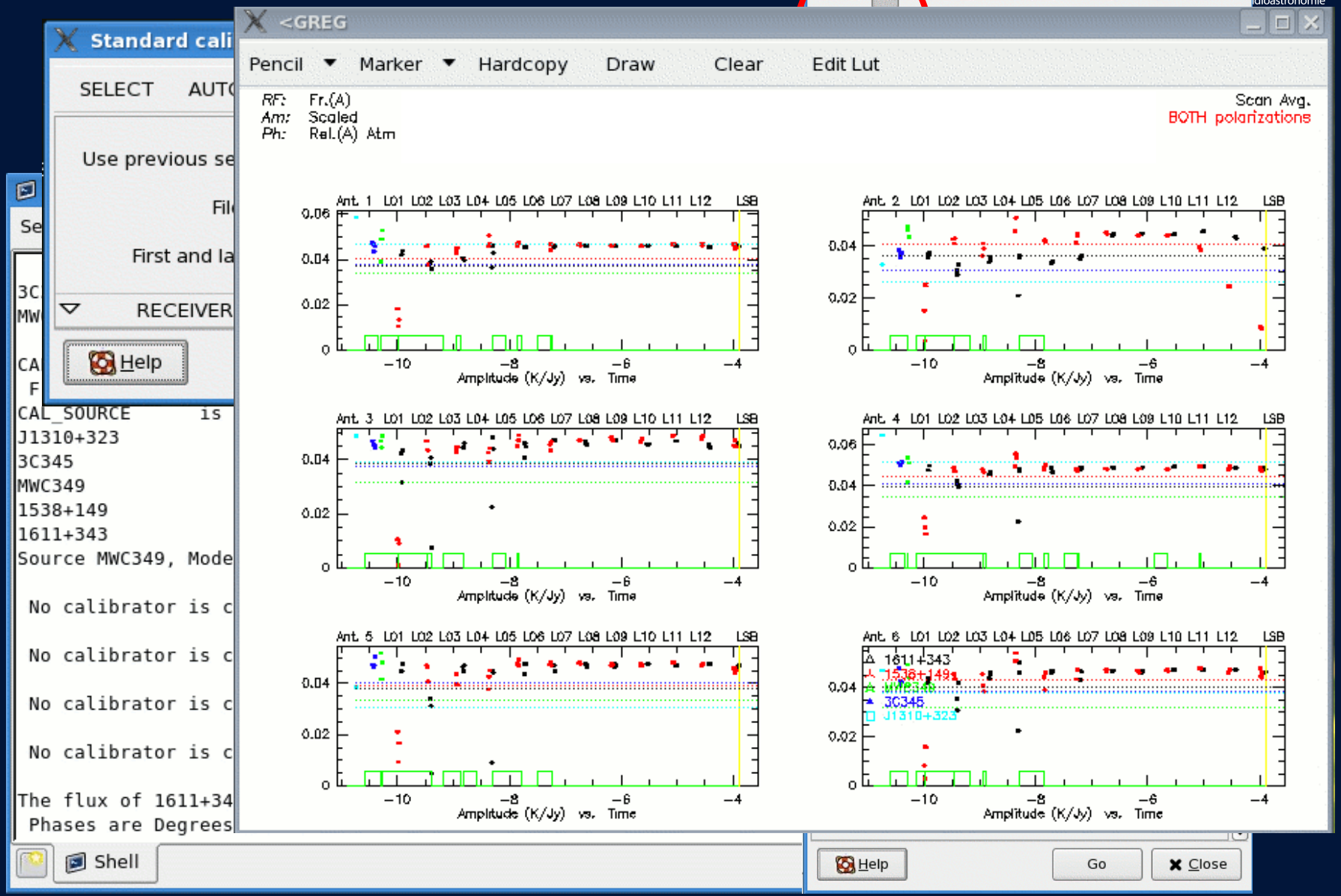
Motivation


Standard calibration package for NGR
SELECT
AUTOFLAG
PHCOR
RF
PHASE
FLUX
Use previous settings ?
Yes
Flux Receiver 1
SOLVE
GET RESULT
STORE
PLOT
>> NEXT
SOLVE
SOLVE SIMPLY
22.16 23.45 21.91 20.59 21.42 21.65
Scan list ?
8619 9161
Calibrator J1310+323
Input Flux?
1.072
Model Flux 1.13 Jy
Go
Close
krips@bure6b:~/project/w04c - Shell - Konsole
Session
Edit
View
Bookmarks
Settings
Help
3C345 is not considered for flux calibration, since phases are too instable
MWC349 is not considered for flux calibration, since phases are too instable
CALIB_FLAGGED is a logical Array of dimensions 5
F T T F F
CAL_SOURCE is a character* 20 Array of dimensions 5
J1310+323
3C345
MWC349
1538+149
1611+343
Source MWC349, Model Flux 1.13 Jy
No calibrator is considered for flux calibration ..., fixing the strongest
No calibrator is considered for flux calibration ..., fixing the strongest
No calibrator is considered for flux calibration ..., fixing the strongest
No calibrator is considered for flux calibration ..., fixing the strongest
The flux of 1611+343 is fixed to 2.185 Jy
Phases are Degrees Continuous 10
Shell

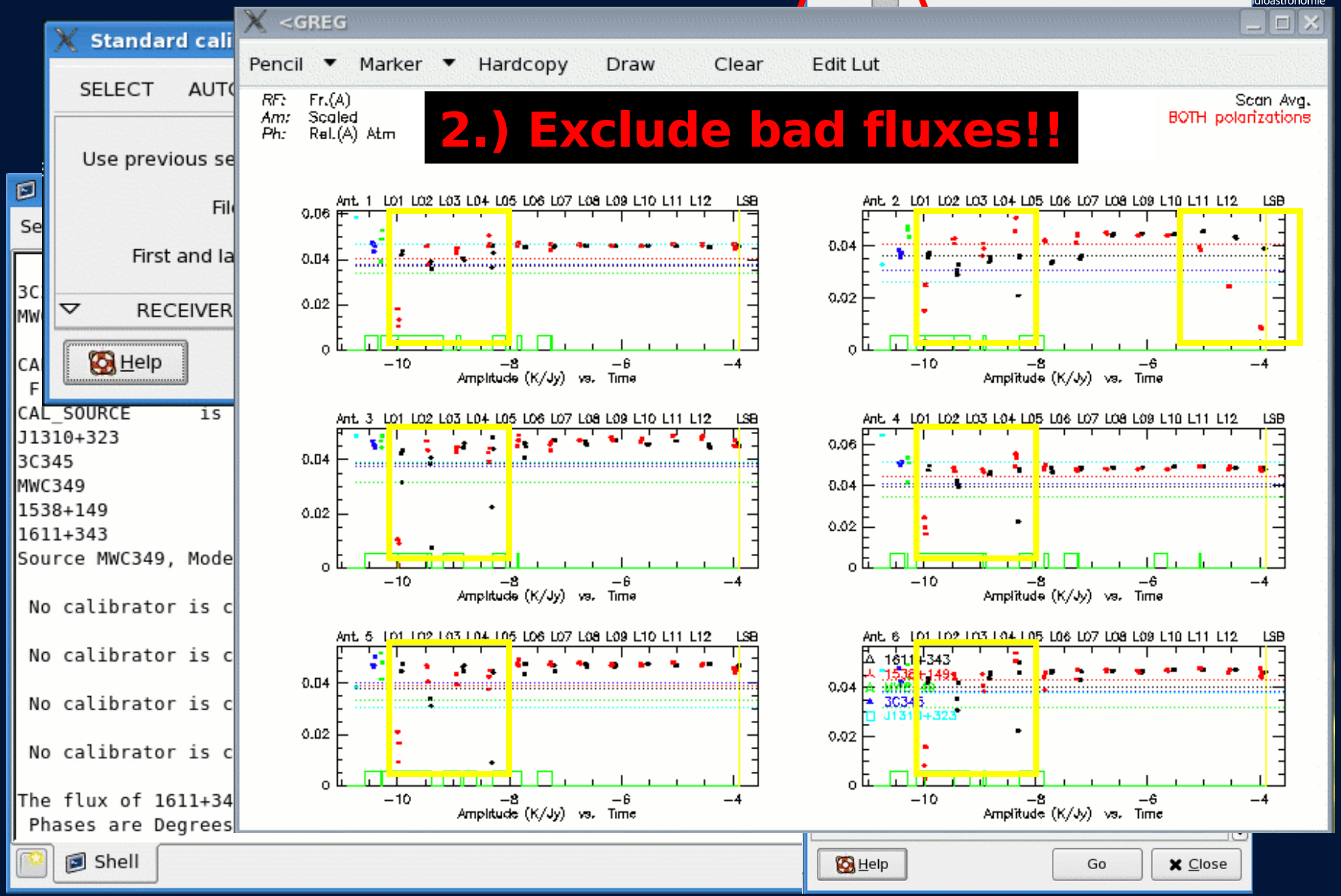
Motivation


Standard calibration package for NGR
SELECT
AUTOFLAG
PHCOR
RF
PHASE
FLUX
Use previous
1.) Choice of flux calibrator!!
Flux Receiver 1
SOLVE
GET RESULT
STORE
PLOT
>> NEXT
SOLVE
SOLVE SIMPLY
22.16 23.45 21.91 20.59 21.42 21.65
8619 9161
Calibrator J1310+323
Model Flux 1.13 Jy
Go
Close
krips@bure6b:~/
Session
Edit
View
Bookmarks
Settings
Help
3C345 is not considered for flux calibration, since phases are too instable
MWC349 is not considered for flux calibration, since phases are too instable
CALIB_FLAGGED is a logical Array of dimensions 5
F T T F F
CAL_SOURCE is a character* 20 Array of dimensions 5
J1310+323
3C345
MWC349
1538+149
1611+343
Source MWC349, Model Flux 1.13 Jy
No calibrator is considered for flux calibration ..., fixing the strongest
No calibrator is considered for flux calibration ..., fixing the strongest
No calibrator is considered for flux calibration ..., fixing the strongest
No calibrator is considered for flux calibration ..., fixing the strongest
The flux of 1611+343 is fixed to 2.185 Jy
Phases are Degrees Continuous 10
Shell

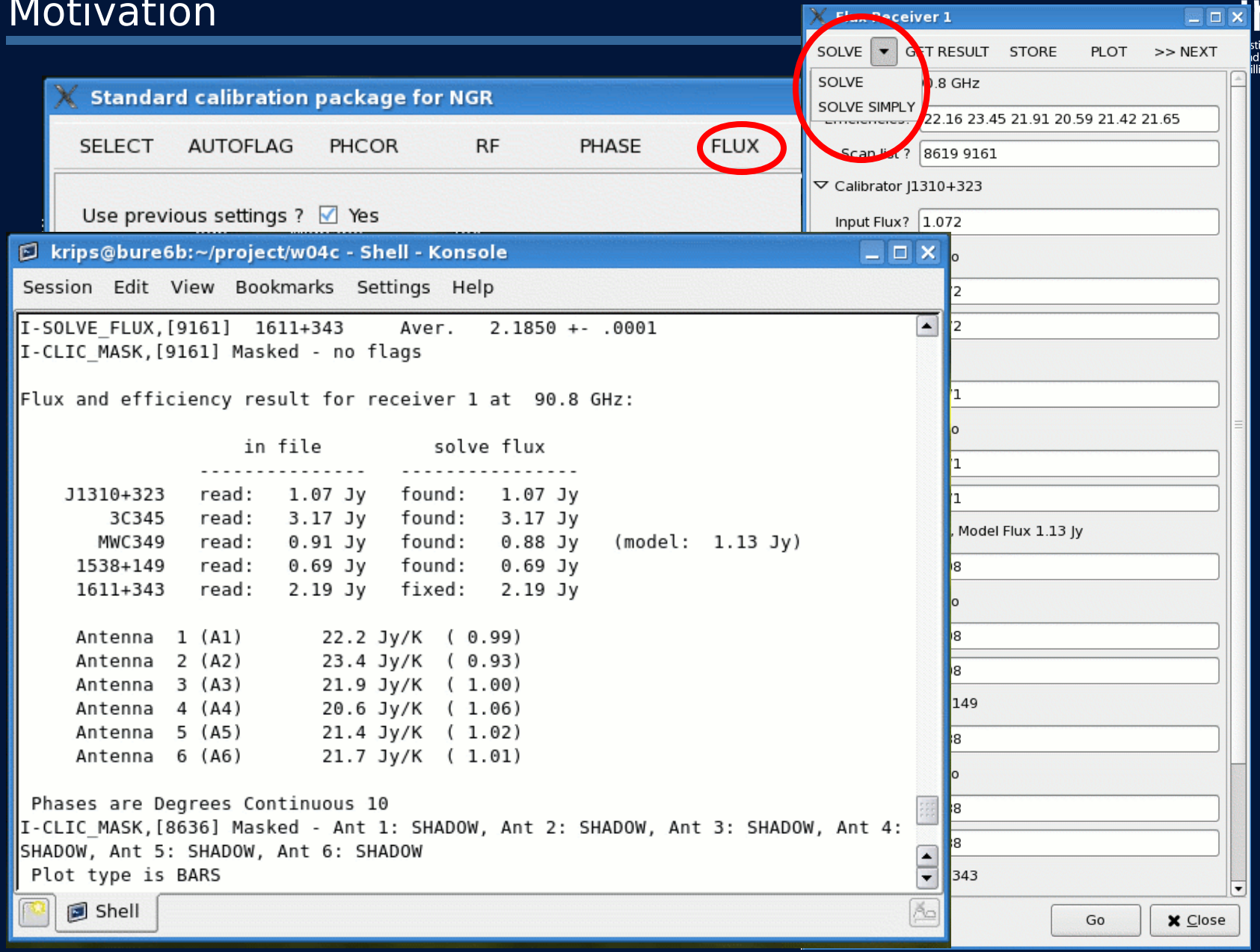
Motivation


Flux Receiver 1
SOLVE
GET RESULT
STORE
PLOT
>> NEXT
<GREG
Pencil
Marker
Hardcopy
Draw
Clear
Edit Lut
RF: Fr.(A)
Am: Scaled
Ph: Rel.(A) Atm
Scan Avg.
BOTH polarizations
Ant. 1 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Ant. 2 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Ant. 3 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Ant. 4 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Ant. 5 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Ant. 6 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Amplitude (K/Jy) vs. Time
1611+343
1538+149
MWC349
3C345
J1310+323
Standard cali
SELECT
Use previous se
First and la
RECEIVER
Help
CAL_SOURCE is
J1310+323
3C345
MWC349
1538+149
1611+343
Source MWC349, Mode
No calibrator is c
No calibrator is c
No calibrator is c
No calibrator is c
The flux of 1611+34
Phases are Degrees
Shell
Help
Go
Close

Motivation


Flux Receiver 1
SOLVE
GET RESULT
STORE
PLOT
>> NEXT
<GREG
Pencil
Marker
Hardcopy
Draw
Clear
Edit Lut
RF: Fr.(A)
Am: Scaled
Ph: Rel.(A) Atm
2.) Exclude bad fluxes!!
Scan Avg.
BOTH polarizations
Ant. 1 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Ant. 2 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Ant. 3 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Ant. 4 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Ant. 5 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Ant. 6 L01 L02 L03 L04 L05 L06 L07 L08 L09 L10 L11 L12 LSB
Amplitude (K/Jy) vs. Time
Standard cali
SELECT
Use previous se
First and la
RECEIVER
Help
CAL_SOURCE is
J1310+323
3C345
MWC349
1538+149
1611+343
Source MWC349, Mode
No calibrator is c
No calibrator is c
No calibrator is c
No calibrator is c
The flux of 1611+34
Phases are Degrees
Shell
Help
Go
Close

Motivation


Standard calibration package for NGR
SELECT
AUTOFLAG
PHCOR
RF
PHASE
FLUX
Use previous settings ?
Yes
Flux Receiver 1
SOLVE
GET RESULT
STORE
PLOT
>> NEXT
SOLVE
SOLVE SIMPLY
22.16 23.45 21.91 20.59 21.42 21.65
Scan list ?
8619 9161
Calibrator J1310+323
Input Flux?
1.072
Model Flux 1.13 Jy
Go
Close
krips@bure6b:~/project/w04c - Shell - Konsole
Session
Edit
View
Bookmarks
Settings
Help
I-SOLVE_FLUX,[9161] 1611+343 Aver. 2.1850 +- .0001
I-CLIC_MASK,[9161] Masked - no flags
Flux and efficiency result for receiver 1 at 90.8 GHz:
in file
solve flux
J1310+323 read: 1.07 Jy found: 1.07 Jy
3C345 read: 3.17 Jy found: 3.17 Jy
MWC349 read: 0.91 Jy found: 0.88 Jy (model: 1.13 Jy)
1538+149 read: 0.69 Jy found: 0.69 Jy
1611+343 read: 2.19 Jy fixed: 2.19 Jy
Antenna 1 (A1) 22.2 Jy/K (0.99)
Antenna 2 (A2) 23.4 Jy/K (0.93)
Antenna 3 (A3) 21.9 Jy/K (1.00)
Antenna 4 (A4) 20.6 Jy/K (1.06)
Antenna 5 (A5) 21.4 Jy/K (1.02)
Antenna 6 (A6) 21.7 Jy/K (1.01)
Phases are Degrees Continuous 10
I-CLIC_MASK,[8636] Masked - Ant 1: SHADOW, Ant 2: SHADOW, Ant 3: SHADOW, Ant 4: SHADOW, Ant 5: SHADOW, Ant 6: SHADOW
Plot type is BARS
Shell

Motivation

3.) Check Antenna efficiencies And found source fluxes!!!

Standard calibration package for NGR

SELECT

Use previou

Flux Receiver 1

SOLVE | GET RESULT | STORE | PLOT | >> NEXT

SOLVE

SOLVE SIMPLY

.8 GHz

1 20.59 21.42 21.65

, Model Flux 1.13 Jy

149

343

Go | Close

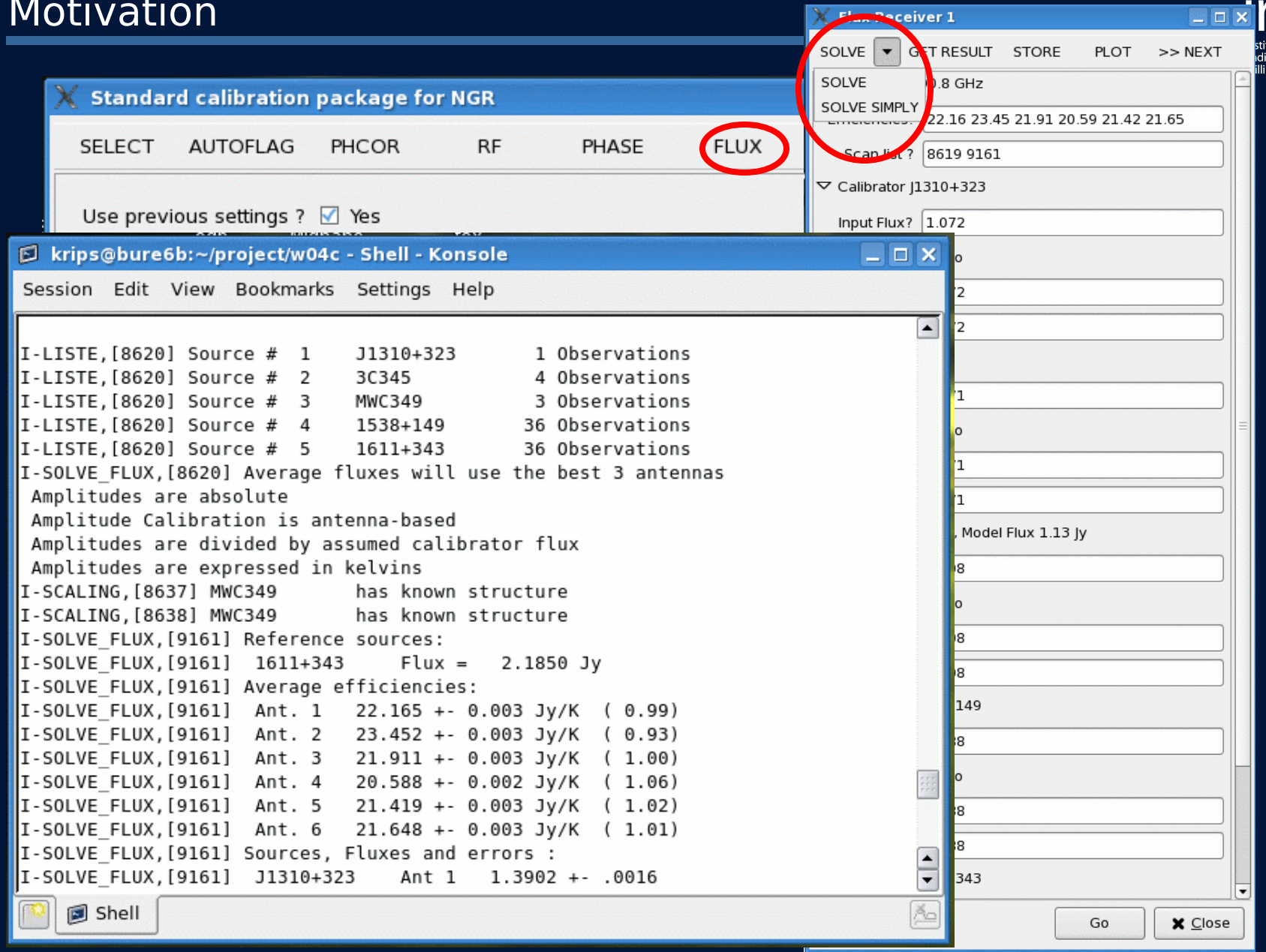
krips@bure6b:~/project/w04c - Shell - Konsole

Session Edit View Bookmarks Settings Help

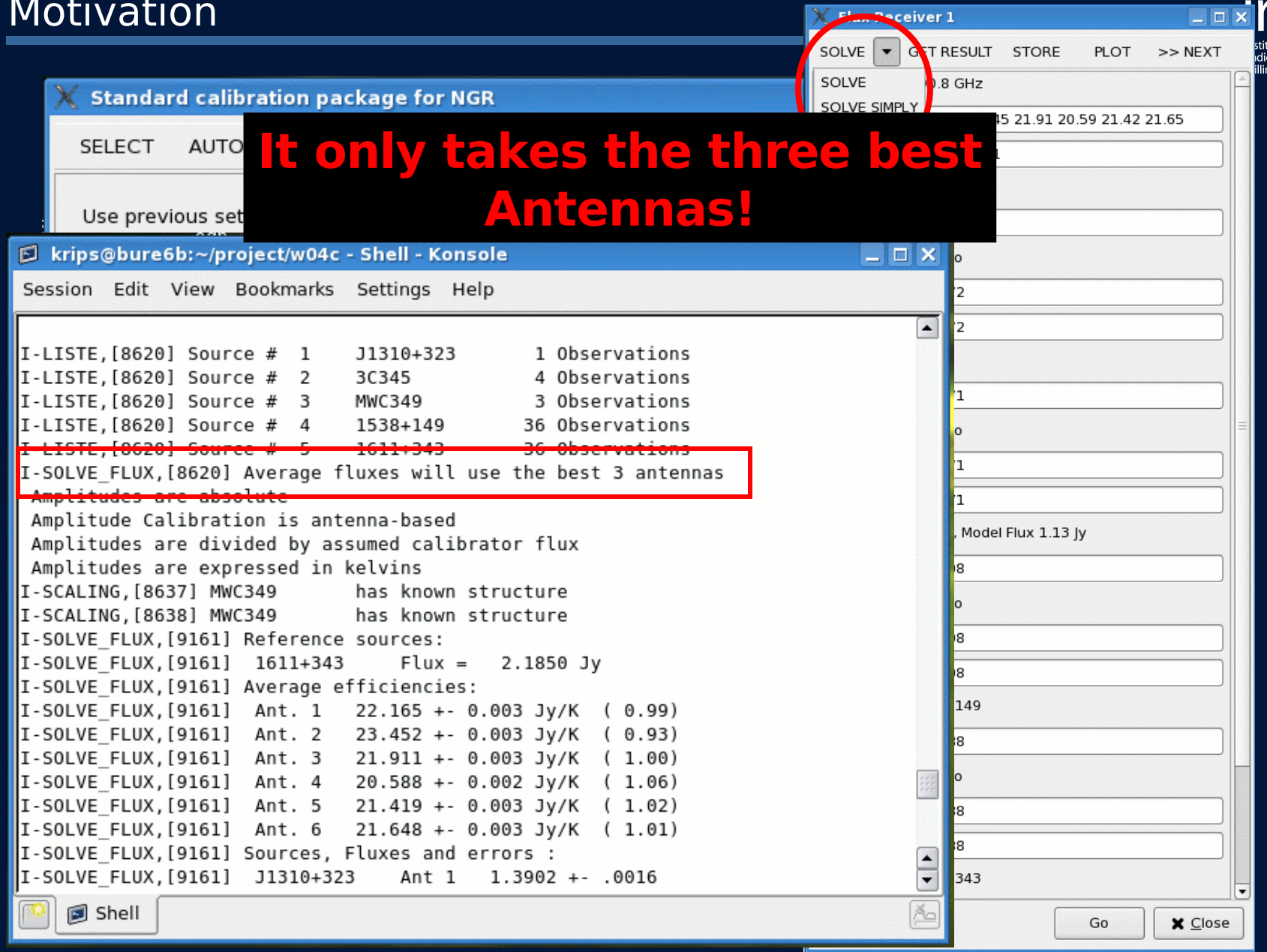
```
I-SOLVE_FLUX,[9161]  1611+343     Aver.    2.1850 +- .0001
I-CLIC_MASK,[9161] Masked - no flags

Flux and efficiency result for receiver 1 at  90.8 GHz:

                in file          solve flux
              ---------------    ----------------
 J1310+323    read:    1.07 Jy   found:    1.07 Jy
     3C345    read:    3.17 Jy   found:    3.17 Jy
    MWC349    read:    0.91 Jy   found:    0.88 Jy   (model:  1.13 Jy)
  1538+149    read:    0.69 Jy   found:    0.69 Jy
  1611+343    read:    2.19 Jy   fixed:    2.19 Jy

  Antenna  1 (A1)       22.2 Jy/K  ( 0.99)
  Antenna  2 (A2)       23.4 Jy/K  ( 0.93)
  Antenna  3 (A3)       21.9 Jy/K  ( 1.00)
  Antenna  4 (A4)       20.6 Jy/K  ( 1.06)
  Antenna  5 (A5)       21.4 Jy/K  ( 1.02)
  Antenna  6 (A6)       21.7 Jy/K  ( 1.01)

 Phases are Degrees Continuous 10
I-CLIC_MASK,[8636] Masked - Ant 1: SHADOW, Ant 2: SHADOW, Ant 3: SHADOW, Ant 4:
SHADOW, Ant 5: SHADOW, Ant 6: SHADOW
 Plot type is BARS
```

Shell

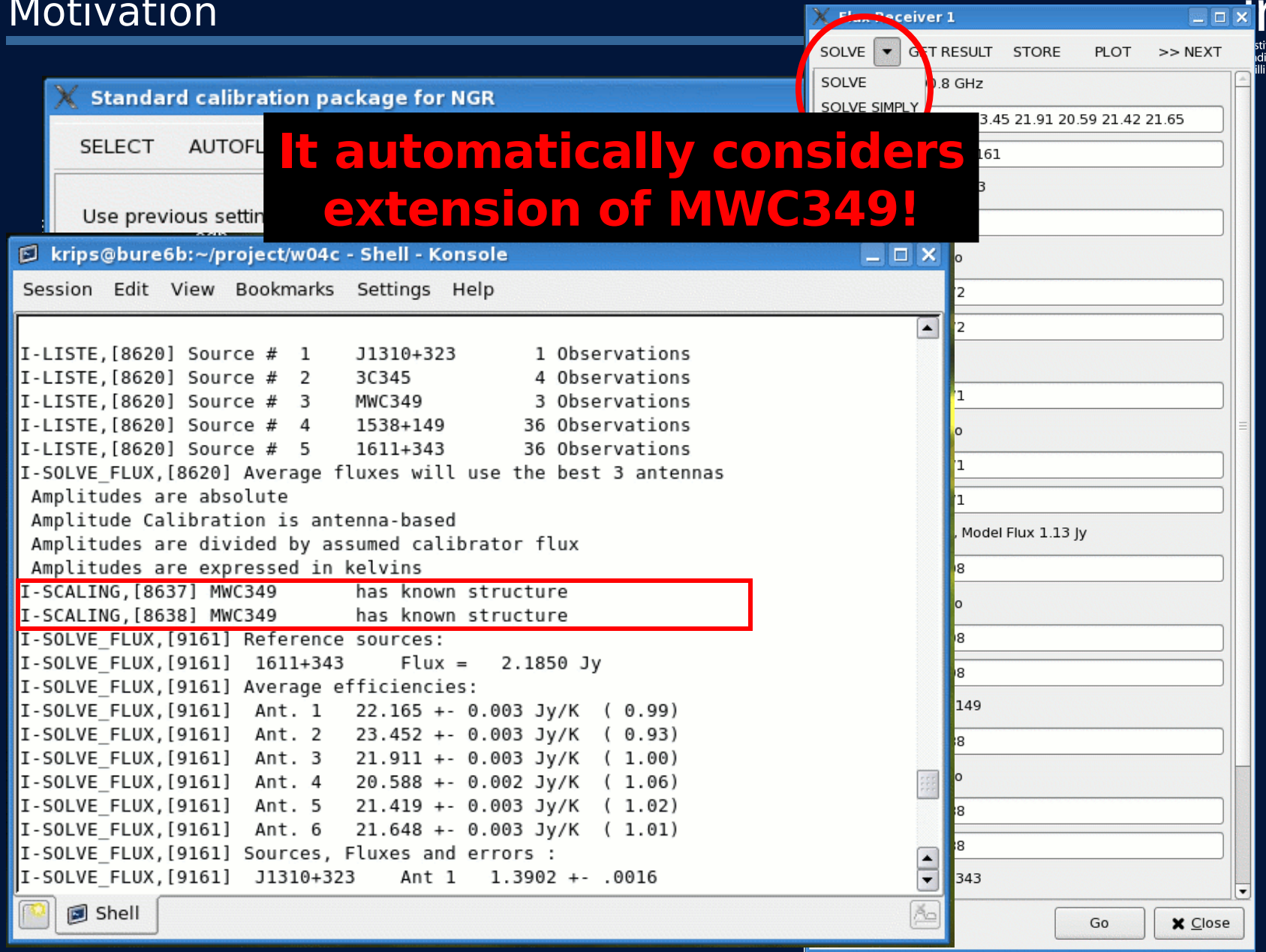
Motivation


Standard calibration package for NGR
SELECT
AUTOFLAG
PHCOR
RF
PHASE
FLUX
Use previous settings ?
Yes
Flux Receiver 1
SOLVE
GET RESULT
STORE
PLOT
>> NEXT
SOLVE
SOLVE SIMPLY
22.16 23.45 21.91 20.59 21.42 21.65
Scan list ?
8619 9161
Calibrator J1310+323
Input Flux?
1.072
Model Flux 1.13 Jy
Go
Close
krips@bure6b:~/project/w04c - Shell - Konsole
Session
Edit
View
Bookmarks
Settings
Help
I-LISTE,[8620] Source # 1 J1310+323 1 Observations
I-LISTE,[8620] Source # 2 3C345 4 Observations
I-LISTE,[8620] Source # 3 MWC349 3 Observations
I-LISTE,[8620] Source # 4 1538+149 36 Observations
I-LISTE,[8620] Source # 5 1611+343 36 Observations
I-SOLVE_FLUX,[8620] Average fluxes will use the best 3 antennas
Amplitudes are absolute
Amplitude Calibration is antenna-based
Amplitudes are divided by assumed calibrator flux
Amplitudes are expressed in kelvins
I-SCALING,[8637] MWC349 has known structure
I-SCALING,[8638] MWC349 has known structure
I-SOLVE_FLUX,[9161] Reference sources:
I-SOLVE_FLUX,[9161] 1611+343 Flux = 2.1850 Jy
I-SOLVE_FLUX,[9161] Average efficiencies:
I-SOLVE_FLUX,[9161] Ant. 1 22.165 +- 0.003 Jy/K (0.99)
I-SOLVE_FLUX,[9161] Ant. 2 23.452 +- 0.003 Jy/K (0.93)
I-SOLVE_FLUX,[9161] Ant. 3 21.911 +- 0.003 Jy/K (1.00)
I-SOLVE_FLUX,[9161] Ant. 4 20.588 +- 0.002 Jy/K (1.06)
I-SOLVE_FLUX,[9161] Ant. 5 21.419 +- 0.003 Jy/K (1.02)
I-SOLVE_FLUX,[9161] Ant. 6 21.648 +- 0.003 Jy/K (1.01)
I-SOLVE_FLUX,[9161] Sources, Fluxes and errors :
I-SOLVE_FLUX,[9161] J1310+323 Ant 1 1.3902 +- .0016
Shell

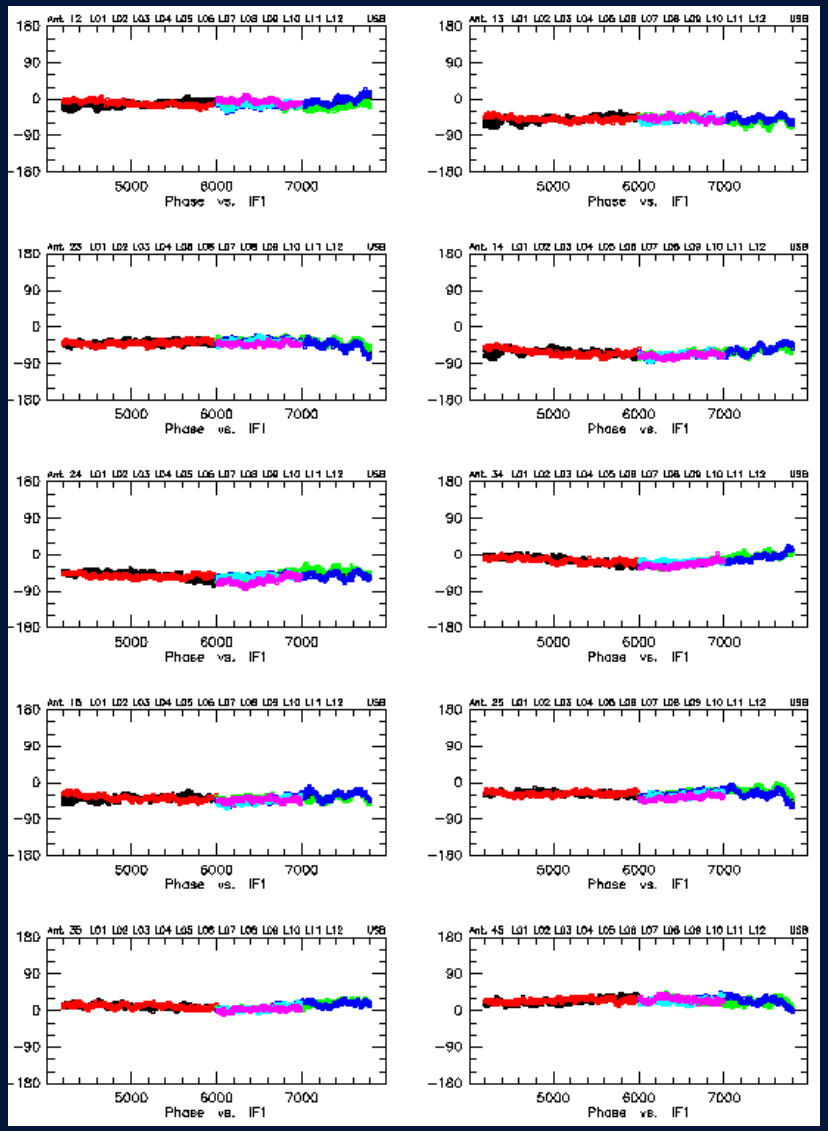
Motivation

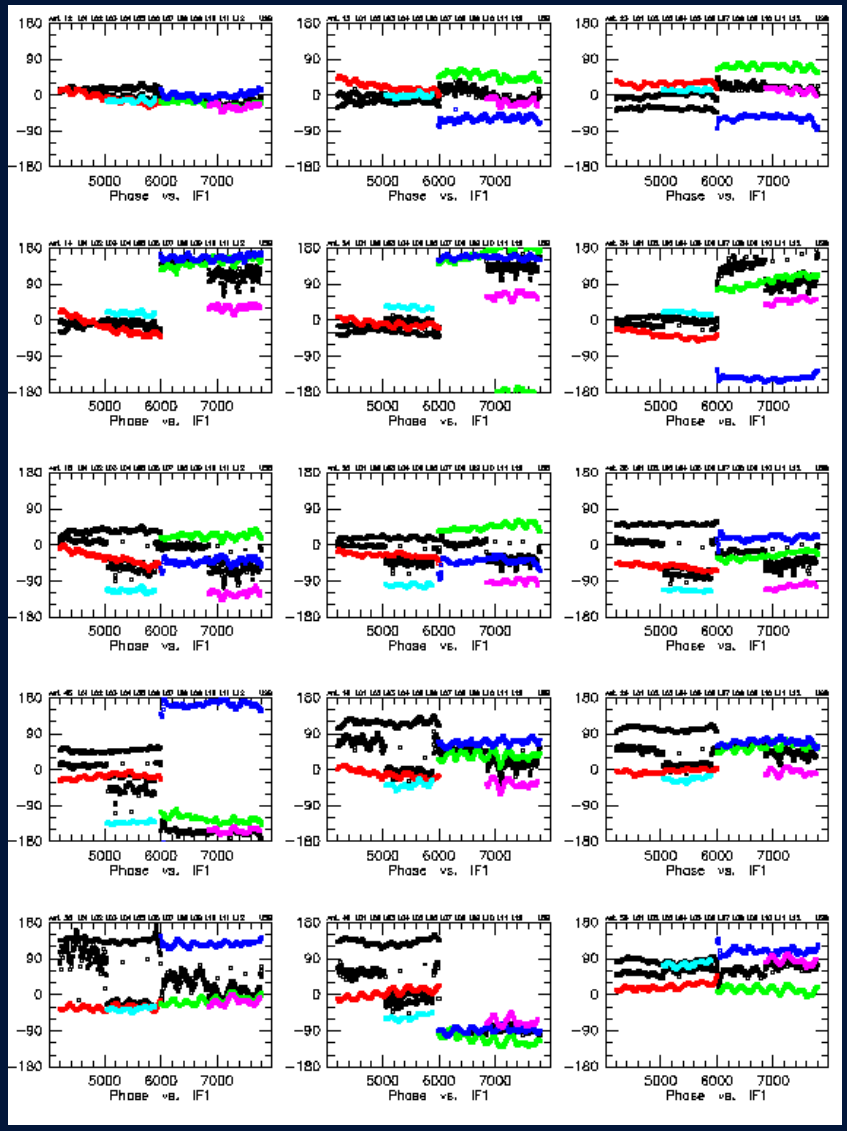

Standard calibration package for NGR
SELECT
AUTO
Use previous set
It only takes the three best Antennas!
Flux Receiver 1
SOLVE
GET RESULT
STORE
PLOT
>> NEXT
SOLVE
SOLVE SIMPLY
.8 GHz
45 21.91 20.59 21.42 21.65
, Model Flux 1.13 Jy
149
343
Go
Close
krips@bure6b:~/project/w04c - Shell - Konsole
Session Edit View Bookmarks Settings Help
I-LISTE,[8620] Source # 1 J1310+323 1 Observations
I-LISTE,[8620] Source # 2 3C345 4 Observations
I-LISTE,[8620] Source # 3 MWC349 3 Observations
I-LISTE,[8620] Source # 4 1538+149 36 Observations
I-LISTE,[8620] Source # 5 1611+343 36 Observations
I-SOLVE_FLUX,[8620] Average fluxes will use the best 3 antennas
Amplitudes are absolute
Amplitude Calibration is antenna-based
Amplitudes are divided by assumed calibrator flux
Amplitudes are expressed in kelvins
I-SCALING,[8637] MWC349 has known structure
I-SCALING,[8638] MWC349 has known structure
I-SOLVE_FLUX,[9161] Reference sources:
I-SOLVE_FLUX,[9161] 1611+343 Flux = 2.1850 Jy
I-SOLVE_FLUX,[9161] Average efficiencies:
I-SOLVE_FLUX,[9161] Ant. 1 22.165 +- 0.003 Jy/K (0.99)
I-SOLVE_FLUX,[9161] Ant. 2 23.452 +- 0.003 Jy/K (0.93)
I-SOLVE_FLUX,[9161] Ant. 3 21.911 +- 0.003 Jy/K (1.00)
I-SOLVE_FLUX,[9161] Ant. 4 20.588 +- 0.002 Jy/K (1.06)
I-SOLVE_FLUX,[9161] Ant. 5 21.419 +- 0.003 Jy/K (1.02)
I-SOLVE_FLUX,[9161] Ant. 6 21.648 +- 0.003 Jy/K (1.01)
I-SOLVE_FLUX,[9161] Sources, Fluxes and errors :
I-SOLVE_FLUX,[9161] J1310+323 Ant 1 1.3902 +- .0016
Shell

Motivation


Standard calibration package for NGR
SELECT
AUTOFL
Use previous settin
Flux Receiver 1
SOLVE
GET RESULT
STORE
PLOT
>> NEXT
SOLVE
SOLVE SIMPLY
.8 GHz
3.45 21.91 20.59 21.42 21.65
161
Model Flux 1.13 Jy
149
343
Go
Close
It automatically considers extension of MWC349!
krips@bure6b:~/project/w04c - Shell - Konsole
Session Edit View Bookmarks Settings Help
I-LISTE,[8620] Source # 1 J1310+323 1 Observations
I-LISTE,[8620] Source # 2 3C345 4 Observations
I-LISTE,[8620] Source # 3 MWC349 3 Observations
I-LISTE,[8620] Source # 4 1538+149 36 Observations
I-LISTE,[8620] Source # 5 1611+343 36 Observations
I-SOLVE_FLUX,[8620] Average fluxes will use the best 3 antennas
Amplitudes are absolute
Amplitude Calibration is antenna-based
Amplitudes are divided by assumed calibrator flux
Amplitudes are expressed in kelvins
I-SCALING,[8637] MWC349 has known structure
I-SCALING,[8638] MWC349 has known structure
I-SOLVE_FLUX,[9161] Reference sources:
I-SOLVE_FLUX,[9161] 1611+343 Flux = 2.1850 Jy
I-SOLVE_FLUX,[9161] Average efficiencies:
I-SOLVE_FLUX,[9161] Ant. 1 22.165 +- 0.003 Jy/K (0.99)
I-SOLVE_FLUX,[9161] Ant. 2 23.452 +- 0.003 Jy/K (0.93)
I-SOLVE_FLUX,[9161] Ant. 3 21.911 +- 0.003 Jy/K (1.00)
I-SOLVE_FLUX,[9161] Ant. 4 20.588 +- 0.002 Jy/K (1.06)
I-SOLVE_FLUX,[9161] Ant. 5 21.419 +- 0.003 Jy/K (1.02)
I-SOLVE_FLUX,[9161] Ant. 6 21.648 +- 0.003 Jy/K (1.01)
I-SOLVE_FLUX,[9161] Sources, Fluxes and errors :
I-SOLVE_FLUX,[9161] J1310+323 Ant 1 1.3902 +- .0016
Shell

Practical Tips





iram
Institut de
Radioastronomie
Millimétrique

Questions?