

**CASA: listobs**

1

- List the summary of the data set: `listobs`
  - type `default listobs` in `casa`, hit enter
  - type `inp`
  - populate the relevant adverbs, e.g.,

```
vis          = 'day2_TDEM0003_20s_full'
verbose     =      True
listfile    =      ''
```

- type `go`
- Check the `casa` logger

**CASA: plotants**

2

- To make a graphical plot of the antenna positions: `plotants`
  - type `default plotants` in `casa`, hit enter
  - type `inp`
  - populate the relevant adverbs, e.g.,

```
vis          = 'day2_TDEM0003_20s_full'
figfile     =      ''
```

- type `go`

**CASA: plotms**

3

- To plot the data using various types of axes: `plotms`
  - Plot amplitude vs. time
  - type `default plotms` in `casa`, then type `inp`

```
vis          = 'day2_TDEM0003_20s_full'
xaxis       = 'time'
yaxis       = 'amp'
selectdata  = true
  spw       = '0:4~60'
  correlation = 'RR,LL'
averagedata = true
  avgchannel = '64'
coloraxis   = 'field'
```

- type `go`

**CASA: flagdata**

4

- We have identified two problematic antennas.
- To flag, use the task `flagdata`
- type `default flagdata`, then `inp`

```
vis          = 'day2_TDEM0003_20s_full'
mode         = 'manualflag'
spw          = ['0', '1']
field        = ['2,3', '2,3']
selectdata   =      True
  antenna    = ['ea12', 'ea07']
  timerange  = ['03:41:00~04:10:00', '03:21:40~04:10:00']
```

- Type `go`, and check the `casa` logger.



**CASA: setjy**

5

- Flux density calibration using 3C286.
- This source requires a model.
- Use the task `setjy`
- To find out if a model is available (default `setjy`)

```
vis = 'day2_TDEM0003_20s_full'
listmodimages = True
```

- Type `go`
- The list doesn't yet have the Ka-band model of 3C286. We will use the K-band model instead (`3C286_K.im`).

**CASA: setjy**

6

Now set

```
listmodimages = False
field = '7'
modimage = '3C286_K.im'
```

Type `go`

The logger will report:

```
J1331+3030 (fld ind 7) spw 0 [l=1.7762, Q=0, U=0, V=0] Jy, (Perley-Butler 2010)
J1331+3030 (fld ind 7) spw 1 [l=1.7794, Q=0, U=0, V=0] Jy, (Perley-Butler 2010)
```

**CASA: gaincal**

7

- default `gaincal`, then `inp`

```
vis = 'day2_TDEM0003_20s_full'
caltable = 'bpphase.gcal'
field = '5'
spw = '0~1:20~40'
solint = 'int'
refant = 'ea02'
gaintype = 'G'
calmode = 'p'
gaincurve = True
```

`go`**CASA: plotcal**

8

- `gaincal` made the table `bpphase.gcal`
- Plot the derived solutions: `plotcal`

```
default plotcal
caltable = 'bpphase.gcal'
xaxis = 'time'
yaxis = 'phase'
subplot = 331
iteration = 'antenna'
plotrange = [0,0,-180,180]
go
```



**CASA: bandpass**

9

- **Bandpass calibration:** `bandpass`  

```
default bandpass
vis                = 'day2_TDEM0003_20s_full'
caltable           = 'bandpass.bcal'
field              = '5'
solint             = 'inf'
refant             = 'ea02'
solnorm            = True
gaintable          = 'bpphase.gcal'
gaincurve          = True
go
```

**CASA: plotcal**

10

- `bandpass` made the table `bandpass.bcal`
- **Plot the derived amplitude solutions:** `plotcal`  

```
default plotcal
caltable           = 'bandpass.bcal'
xaxis              = 'chan'
yaxis              = 'amp'
subplot            = 331
iteration           = 'antenna'
go
```

**CASA: plotcal**

11

- **Plot the derived phase solutions:** `plotcal`  

```
tget plotcal
yaxis              = 'phase'
go
```

**The spectral line data set**

12

- The continuum-subtracted spectral-line data set is `IRC10216_spls.ms`. Plot the lines  

```
default plotms
vis                = 'IRC10216_spls.ms'
xaxis              = 'channel'
yaxis              = 'amp'
averagedata        = True
  avgtime           = '1e8'
  avgscan           = True
coloraxis          = 'spw'
go
```



**CASA: Clean****13**

- For illustration: image/clean channel 22 of the SiS line.

```
default clean
vis                = 'IRC10216_spls.ms'
imagename          = 'ch22'
spw                = '1:22~22'
mode               = 'channel'
nchan              = 1
start              = ''
width              = 1
niter              = 100000
gain               = 0.1
threshold          = '3.0mJy'
```

**Don't type go yet****CASA: Clean****14**

```
psfmode            = 'clark'
imagermode         = 'csclean'
interactive         = True
npercycle          = 100
imsize             = 300
cell               = ['0.4arcsec', '0.4arcsec']
stokes              = 'I'
weighting          = 'briggs'
robust              = 0.5
go
```

**CASA: immoments****15**

- Determine the channels with emission in the SiS image cube.
- Make moment maps using the task `immoments`

```
default immoments
imagename          = 'IRC10216_SiS.image'
moments            = [0]
axis               = 'spectral'
chans              = '12~40'
outfile            = 'IRC10216_SiS.mom0'
go
```

- Specify appropriate pixel ranges if necessary (through `includepix` and/or `excludepix` parameters).

