

VLBI Tutorial

Enno will have us working on a VLBI dataset. LOFAR is fundamentally a VLBI instrument, so it will be useful to explore how VLBI is different from connected-element interferometry.

Testing

J Eisloffel's notes

```
load the data, get FITS files from

http://www.astro.rub.de/middelberg/tmp/v211a_calib.fits
http://www.astro.rub.de/middelberg/tmp/v211b_calib.fits

chdir to directory where FITS files are, then start Aips

load the data
=====

tget fitld (or use "task 'fitld'")
default
datain 'PWD:v211a_calib.fits'
outname 'v211a'
go

Do the same with the other file
=====

tget fitld
default
datain 'PWD:v211b_calib.fits'
outname 'v211b'
go

make sure the new files have catalog numbers 1 and 2!

Take a look at the scans
=====

tget listr
default
```

```
getn 1
optype 'SCAN'
go
```

```
plot spectra
=====
```

```
tget possm      * or   task 'possm'
default
getn 1
dotv 1
flagver -1
nplots 4
aparm (9) 1
solint 1
aparm 0, 1, 0, 0, -180, 180, 0, 0, 1, 0
go
```

* stop possm by clicking into the window and then pressing d like "done"

* where do the slopes and offsets across the band come from?
* how would one fix it?

```
plot the spectra with first calibration
=====
```

```
tget possm
default
getn 1
dotv 1
docalib 1
gainuse 2
flagver -1
nplots 4
aparm (9) 1
solint 1
aparm 0, 1, 0, 0, -180, 180, 0, 0, 1, 0
go
```

```
the edges of the passband have low amplitudes, flag them:
=====
```

```
tget possm
default
getn 1
dotv 1
```

```
docalib 1
gainuse 2
flagver 1
nplots 4
aparm (9) 1
solint 1
aparm 0, 1, 0, 0, -180, 180, 0, 0, 1, 0
go
```

Now we can average the data across the band and have a look at the phases as a function of time

=====

```
tget vplot * or task 'vplot'
tvinit
default
getn 1
nplots 6
docalib 1
gainuse 2
dotv 1
flagver 1
bchan 1
echan 64
avgif 1
bparm 0 2
go
```

Hmmm, that was a bit messy, zoom into a short section

=====

```
tget vplot
tvinit
default
getn 1
nplots 6
docalib 1
gainuse 2
dotv 1
flagver 1
bchan 1
echan 64
avgif 1
bparm 0 2
timerang 1 0 0 0 1 2 0 0
go
```

*** some tests done on the spot

```
timerang 1,0,0,0,1,2,0,0
bparm 0
go
timerang 0
go
```

Look at the uv plane coverage

=====

```
tget uvplt * or task 'uvplt'
tvinit
default
getn 1
bparm 6 7
bif 1
eif 1
bchan 30
echan 30
dotv 1
go
```

Compare that to the uv plane coverage of the v211b file (after above commands, just "getn 2" and "go" again).

```
tget imagr * or task 'imagr'
default
getn 1
sources '0022-423'
docalib 1
gainuse 6
bchan 1
echan 64
bif 1
eif 4
nchav 64
flagver 1
outname 'DEMO'
cellsi 0.002 0.002
imsize 1024
niter 100
dotv 1
go
```

```
dowait 1
go

* set a box around the dirty image using tvbox, click a, resize box, exit d
* clean with a small clean window
* continue cleaning (wait for 30sec)
* stop cleaning

tvzoom
* d for done

tvfiddle * a to change colour, b/c to zoom in/out, d for done

* make a contour map
task 'kntr'
pcat
getn 4

* help

docont 1
dogrey 1
dovect 0
blc 450,450
trc 560,560
clev = 8.5503E-03
levs = -2,2,4,8,16,32,64
dowedge = 1
cbplot = 1 * cbplot = 2 to set beam plot to lower right
dotv = 1

tvinit
go

dogrey = 1
go

* draw to plot file
tget kntr
dotv = -1
go

* make a postscript file

task 'lwpla'
inp
outfile = 'PWD:demo.ps'
go
```

```
* make a fits-file
```

```
task 'fittp'  
inp  
dataout = 'PWD:demo_enno.fits'      * final ' to capitalise  
go
```

```
getn 1  
task 'listr'  
optyp = 'scan'  
go
```

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