

# Amplitude Calibration

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## What's going on at the telescopes?

$tpical$  = BBC power levels when the cal diode is fired.

$tpi'$  = BBC power levels without the cal diode, but measured close in time to the firing of the cal diode.

$tpi$  = BBC power levels monitored during the scan.

$tpzero$  = BBC power level when maximum attenuation is on.

$tpical$  and  $tpi'$  are typically measured at the beginning/end of scans.

The difference ( $tpical - tpi'$ ) is used to derive the conversion factor from  $tpi$  level to  $T_{sys}$ .

The  $T_{sys}$  is given by the expression:

$$T_{sys} = T_{cal} \times \frac{tpi - tpzero}{(tpical - tpi')}$$

where  $T_{cal}$  is the temperature of the calibration diode (read from the RXG file).

The RXG file contains the values of the  $T_{cal}$  for each receiver as function of the frequency and they are measured during *ad hoc* experiments. The  $tpi$ 's values are read from the Field System log file.

The  $T_{sys}$  is therefore calculated using the script *antabfs.pl* (run at the stations).

## What do we do at JIVE?

- We receive the antab files produced at the station **TWO** weeks after the session ...*more or less on time*. (In case of e-EVN experiments, the antab files are usually sent shortly after the experiment.)
- The ANTAB files from the antennas are checked for obvious inconsistencies. In case of problems, we communicate with the antenna's *VLBI friends*.
- When everything looks fine, we pipeline the data after the post-correlation operations (i.e. after releasing the FITS files to the PIs).

## What should the PI do?

- Download the ANTAB file for the experiment from the JIVE archive and apply the calibration to the data.
- or
- Copy the CL2 table from the TASAV file (on the JIVE archive) to the multi-source file.
- Check the amplitude calibration.
- *Please, enjoy your data!*

## How about the overall calibration of the EVN?

The EVN is healthy! ...*though improvements are always possible.*

NME experiments and ftp tests are important to spot on-the-fly problems and issues at the stations.  
(VoIP conversations)

Strong communication and two-directional feedback between JIVE and the antenna's *VLBI friends*.  
(Pipeline results, NME reports, TOG meetings, EVN Tech)

- At L-band, RFI remains the major source of errors. Calibration at this frequency is quite variable with occasional experiments having quite large errors. However, most L-band experiments give good results. *We are working on a system to monitor the RFIs at the different antennas.*

- Weather
- Cm does not provide  $T_{\text{sys}}$  monitoring (*in progress*)
- Jb Mk2 does not provide  $T_{\text{sys}}$  at K-band (*under investigation*)
- *antabfs.pl* always improving (MK5B  $T_{\text{sys}}$  from the logs)

- Next step and in progress: Opacity corrected gain curves (mainly at K-band)