Status of EVN Amplitude Calibration

Session 3/2011

The following table shows the median absolute amplitude error for EVN
stations in the second session of 2011 (Oct/Nov). These results were
derived from the pipeline amplitude self-calibration results. The number in
brackets after each entry is the number of experiments that were used to
determine the median error for that entry.

Station	18 cm	5 cm	6 cm
Jb1	0.08(6)		0.12(8)*
Jb2		0.25{5}*	
Ef	0.05(6)	0.03(5)	0.03(8)
Mc	0.10(6)	0.06(5)	0.05(8)
On	0.06(6)	0.07(4)	0.08(8)
Tr	0.06(6)	0.04(5)	0.04(7)
Wb	0.04(6)	0.08(5)	0.02(7)
Ys		0.04(5)	0.04(8)
Hh	0.09(1)		0.04(2)
Ur	0.10(5)		0.04(3)
Sh	0.07(4)	0.06(1)	0.33(8)*
Bd	0.05(5)		0.04(3)
Sv	0.08(4)		0.07(3)
Zc	0.04(5)		0.30(3)*

The blank entries indicates insufficient data. The numbers above are the
median absolute error in the antenna gain amplitude (as calculated from
pipeline amplitude self calibration). A value above 0.1 indicates a
significant error which should be investigated. In addition to the absolute
errors summarized here, the EVN pipeline provides details on every
experiment processed at JIVE including the sign and time variability of the
errors. In each experiment, the self-calibration results of a bright and
compact source were used to get the reliable results. Note that nominal
SEFDs, listed in the EVN status table, were used to make antab files for
Bd, Sv, Zc.

*Jb: Jb2 had a sensitivity SEFD ~ 1000 Jy (Tsys ~ 150 K, DPFU ~ 0.13 K/Jy)
at 5/6 cm. There were no reliable Tcal measurments available in the rxg
file.

*Sh: There were no any short baselines to Sh in the e-VLBI experiments
ET018 A-E, the amplitude self-calibration using a point source was failed

to give a meaningful correction factor. Excluding the e-VLBI experiments, Sh has a median absolute error: 0.07(3).

*Zc: Correlation amplitude/sensitivity varied significantly across subbands. This problem is gone now since it
started to use their digital backend in Session 1/2012.

K-band: There are 12 stations (Ef, Ro, Ys, Jb2, On, Nt, Mh, Sv, Zc, Ur, Sh, Hh) available at 1.3cm now. Ef, Ys, On, and Sh have started to provide opacity-free gain curves. Note that Onsala uses different way (Chopper Wheel) to do Tsys measurement and its Tsys data have included opacity correction. Thus, it is not necessary to solve for opacity anymore in the post data reduction for Onsala. As the EVN pipeline does not solve for opacity according to the Tsys data, usually, Onsala has AIPS gain solutions around 0.85 after the amplitude self-calibration. Jb2 has proper total power measurment in the FS log files, while there were no propoer Tcal measurments in the rxg file. Sv and Zc are still using nominal SEFD and a flat gain curve in the antab files. Mh was found to have a SEFD ~4500 in N11K1, a factor of 1.5 higher than the nominal SEFD. Ur has a new 22GHz receiver with a Tsys ~40K. Hh is using a room-temperature receiver and may have problems with pointing. In view of all these problems, a calibration error > 10% is frequently seen.

Jun YANG for the Science Operation and Support Group (JIVE)