

Status of EVN Amplitude Calibration

 Session 2/2013

The following table shows the median absolute amplitude error for EVN stations in the second session of 2013 (May/June). These results were derived from the pipeline amplitude self-calibration results. The number in parentheses after each entry is the number of experiments that were used to determine the median error for that entry.

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Station      6 cm          5 cm          18 cm
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Jb2
Jb1      0.06(6)
Ef       0.07(6)          0.07(6)          0.08(6)
Mc       0.02(7)          0.06(6)          0.07(6)
Nt       0.09(7)          0.10(6)          0.10(6)
On       0.13(6)*         0.15(4)*         0.09(4)
Tr       0.03(5)          0.07(6)          0.10(6)
Wb       0.11(7)          0.10(6)          0.04(6)
Ys       0.08(7)          0.06(6)
Hh       0.04(2)
Ur       0.08(6)
Sh       0.07(6)
Bd       0.04(6)
Zc       0.11(6)
Sv       1.94(6)*
Ar       0.06(2)
Ro
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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.

* Sv: Amplitudes in RCP at 6cm for all projects were quite weak and sometimes useless. Station gave the following feedback: During the EVN 2013 Session 2 there was a problem with C-band cryogenic system at Sv station, so the experiments were carried out with warm receivers. It was repaired but its state is still unstable and actually C-receiver at Sv are needed to be replaced. We have a plan for big repair of it, but not in close future. Most likely it will be replaced with new one warm but with LNA in close future.

* On: Amplitude self calibration show deviations from the expected values that are caused by the use of the DBBC 16MHz filter (with valid bandwidth of only 13 MHz). DBBC was the new standard backend by On on this session. The low amplitude at the edges of the 16 MHz sub-bands, made their central channels to be over weighted, therefore producing the effect discussed in this section.

* Sh: Too low amplitudes on baselines with Sh at 18 cm on EP075G. Phases too noisy. No fringe solutions on baselines with Sh when running the EVN pipeline even for the fringe finder. No evident similar result in other experiments in general, this might be related to the long baseline and the structure/brightness of the source.

* Jb1 at 18cm. No optimum .rxg file has been provided by any of the stations at Jb to perform appropriate antab files for reliable (a priori) amplitude calibration.

- 3.6 cm observations: Calibration gains of up to 1.5 were needed for Ur for N13X3. The rest of the stations seem to give reasonable gains thought.

- 1.3 cm observations: Jb2 sensitivity was a factor of 5-10 worse than the nominal value (SEFD ~ 1000 Jy) during ER034 observed at K-band. There was a similar variation of correlation amplitude vs time on all the sensitive baselines to Jb2. This looks as if Jb2 had a significant and variable pointing error during the observations. The following feedback was given by the station: "There were a couple of pointing-related problems. Over the last 3 weeks the person who deals with this has recalibrated the entire encoder/pointing system." The remaining stations on this session seem to reflect a more or less reasonable calibration. However, residual effects on the gains (sometimes larger than 50%) were found for Ef, Jb2, Mc, Ys, and Sh at low elevations. This suggest that the nominal gain curve of these stations may need to be revised.

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