

Black Board Self Calibration Progress -> Continued

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Outline - Recap

- ① Recap - BBS - Detailed checks on Simulated data
- ② BBS - Checks on CS1 Data & Comparison with MeqTree solutions
- ③ BBS - First Image
- ④ Conclusions - Next Step

BBS CHECKS - OBSERVED DATA-MS1810

- 16 hours, 30 March - 31 March, 2007, 16 dipoles tracking on CasA
- 24 sub bands, each 256 channels, 0.6KHz resolution
- For all analysis Subband 20, around 64.99 MHz

- Visual inspection of image -> does not convey much of calibration quality
- Comparison of solutions obtained by MeqTrees
- Same flagging script.
- Same Channels 31-39 (0 based)

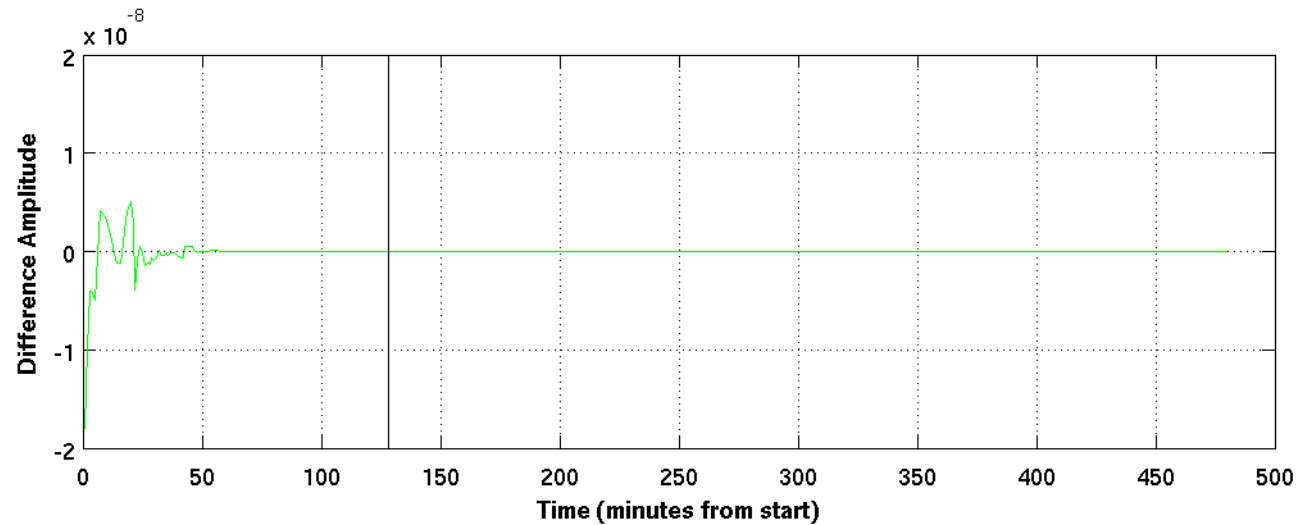
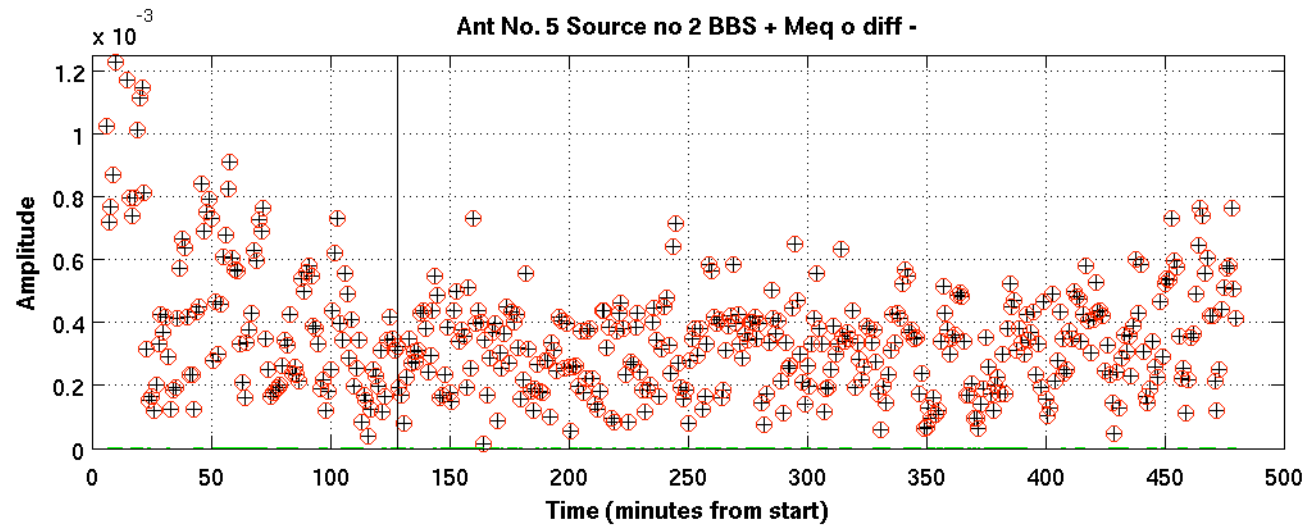
BBS soln -Comparison with MeqTree (Amp)

Antenna 5
(YY)
For dirn CygA

+ BBS

0 MeqTree

-- difference



BBS soln-Comparison with MeqTree(Phase)

Antenna 5

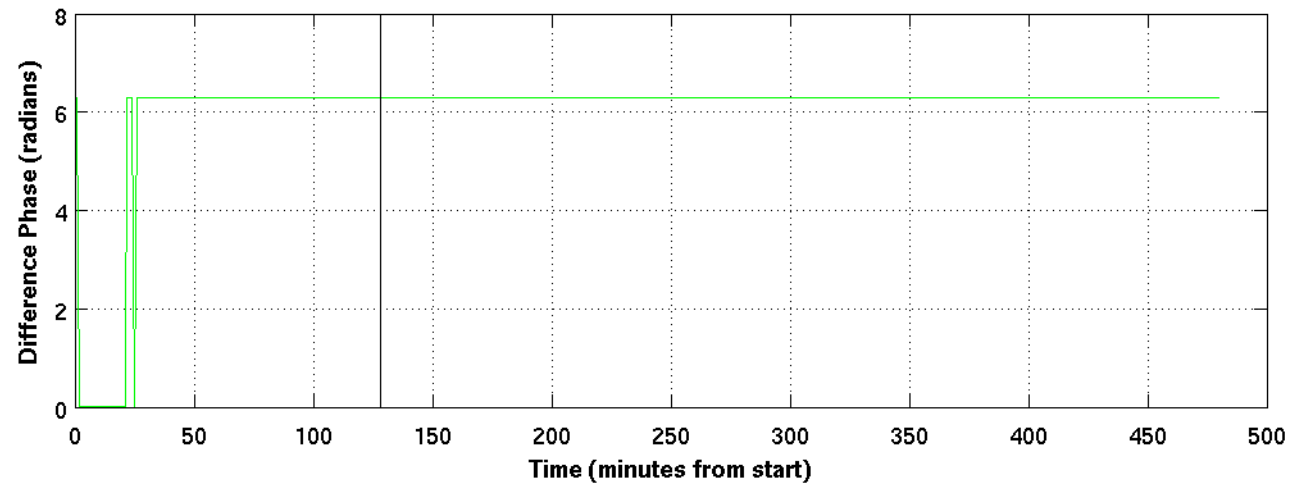
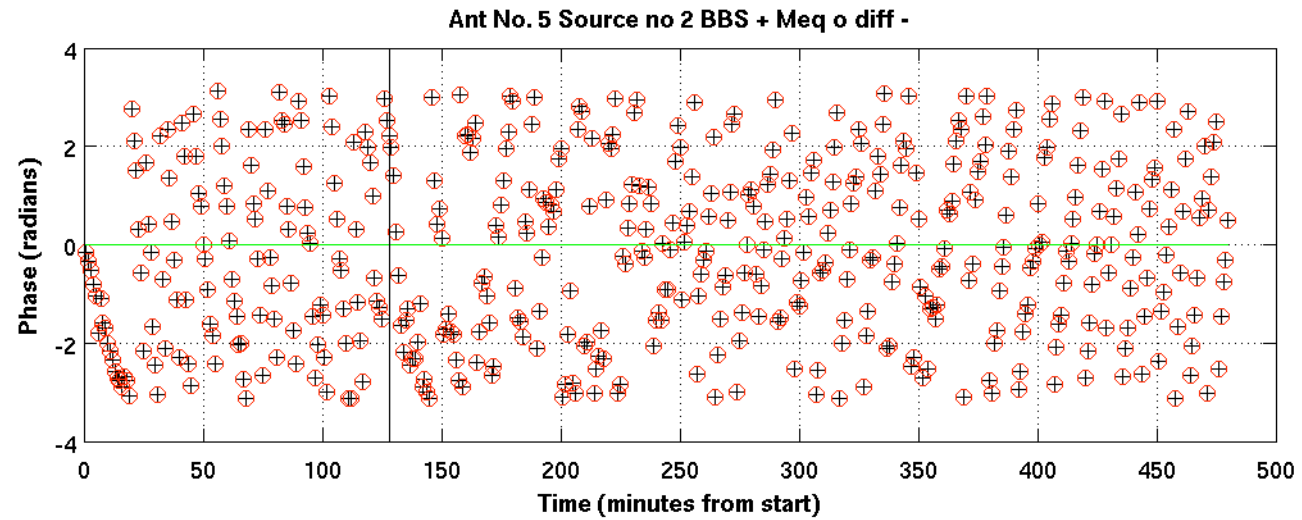
(YY)

For dirn CygA

+ BBS

0 MeqTree

-- difference



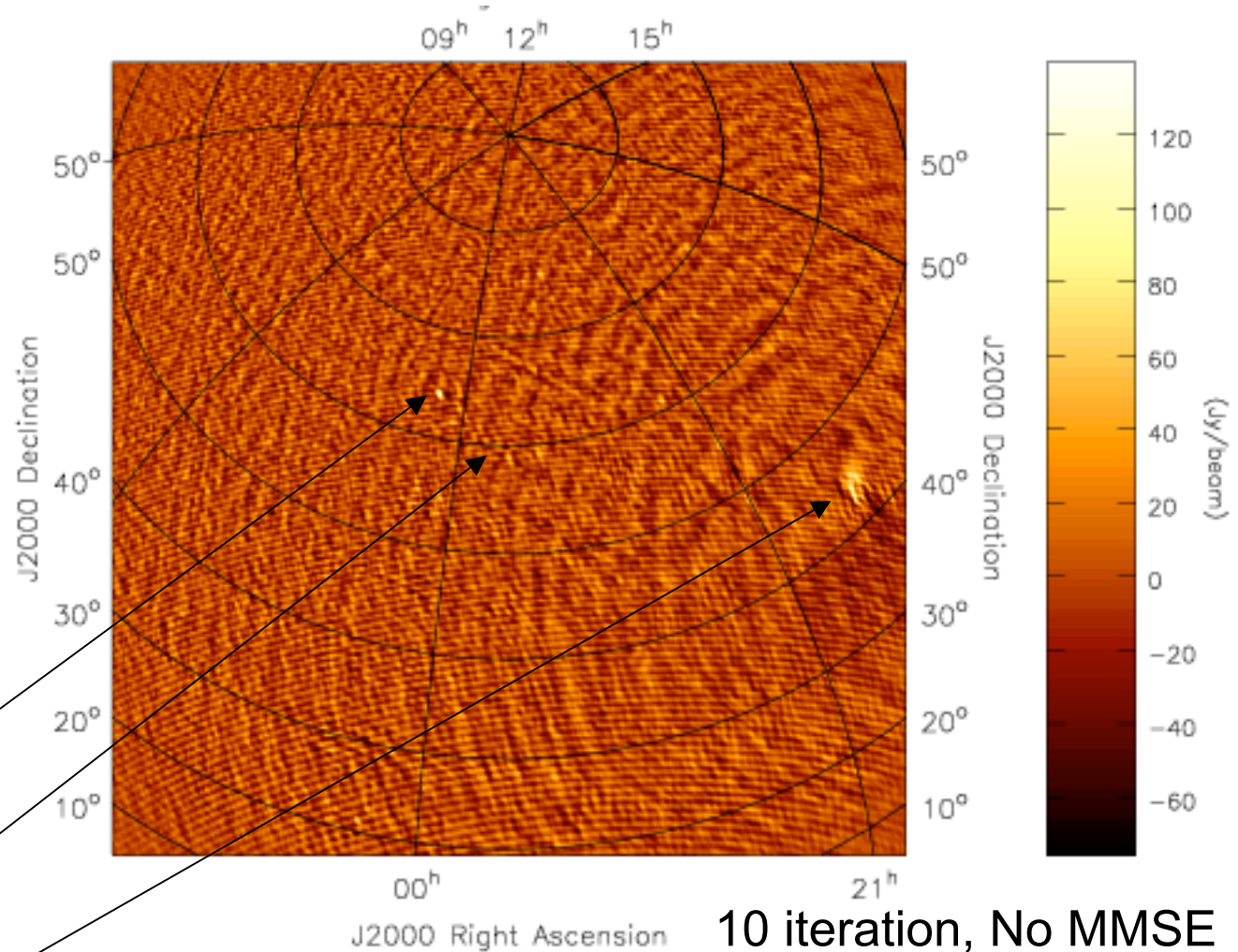
BBS (flip in uvw) - Image

- MS1810, SB20
- Channel 32-39 (BW 4.8 KHz)
- Time used 8 hrs (from start)
- uvw during solv (flipped wrt CS1)
- CasA and CygA subtracted, corrected \rightarrow CasA
- Tycho (140 Jy)
- rms ~ 17 Jy (?)

Tycho

CasA remnant

Cyg A remnant

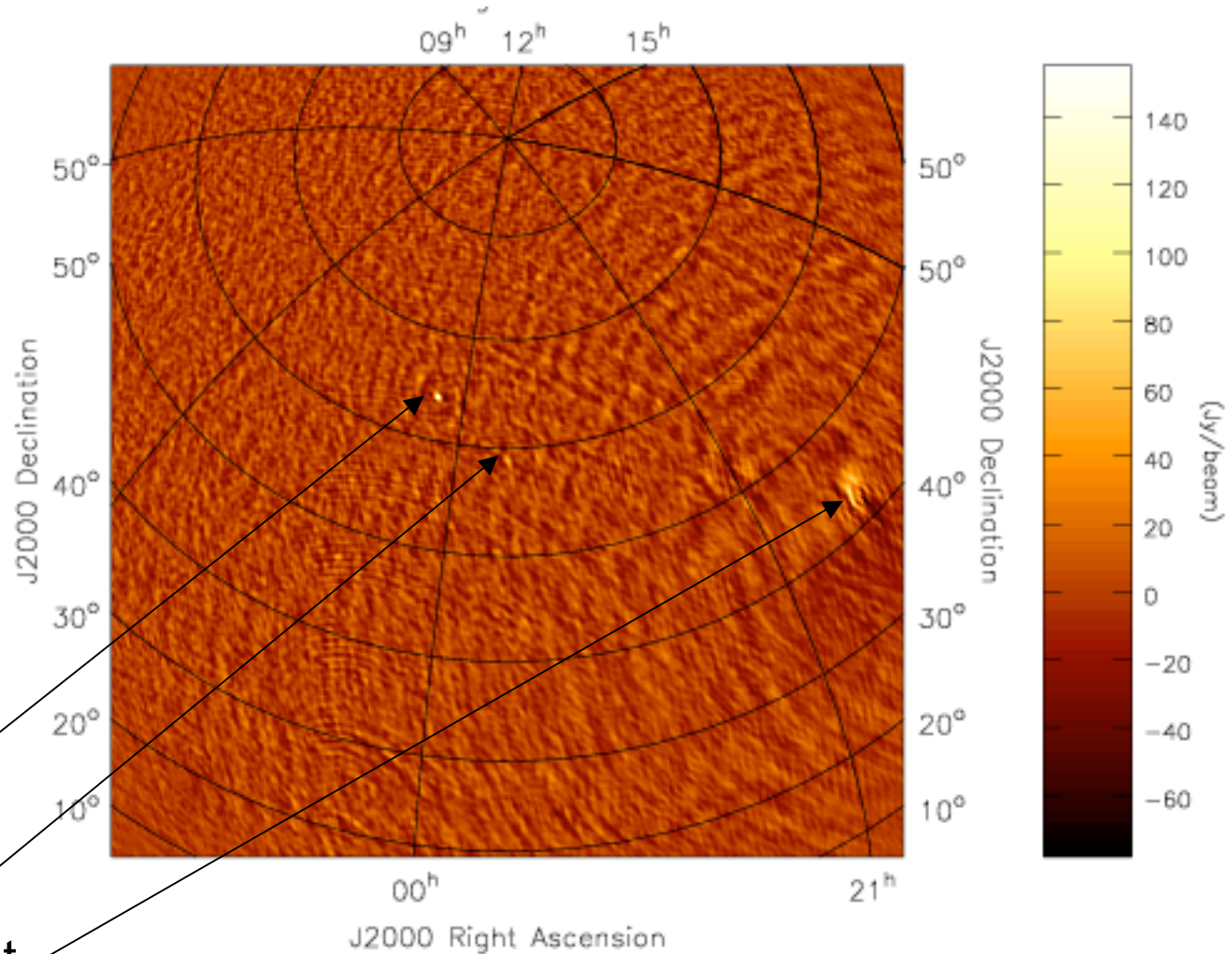


- We showed that can't recover Amplitudes and Phases if we use diff uvw convention during solving

BBS (No flip in uvw) - Image

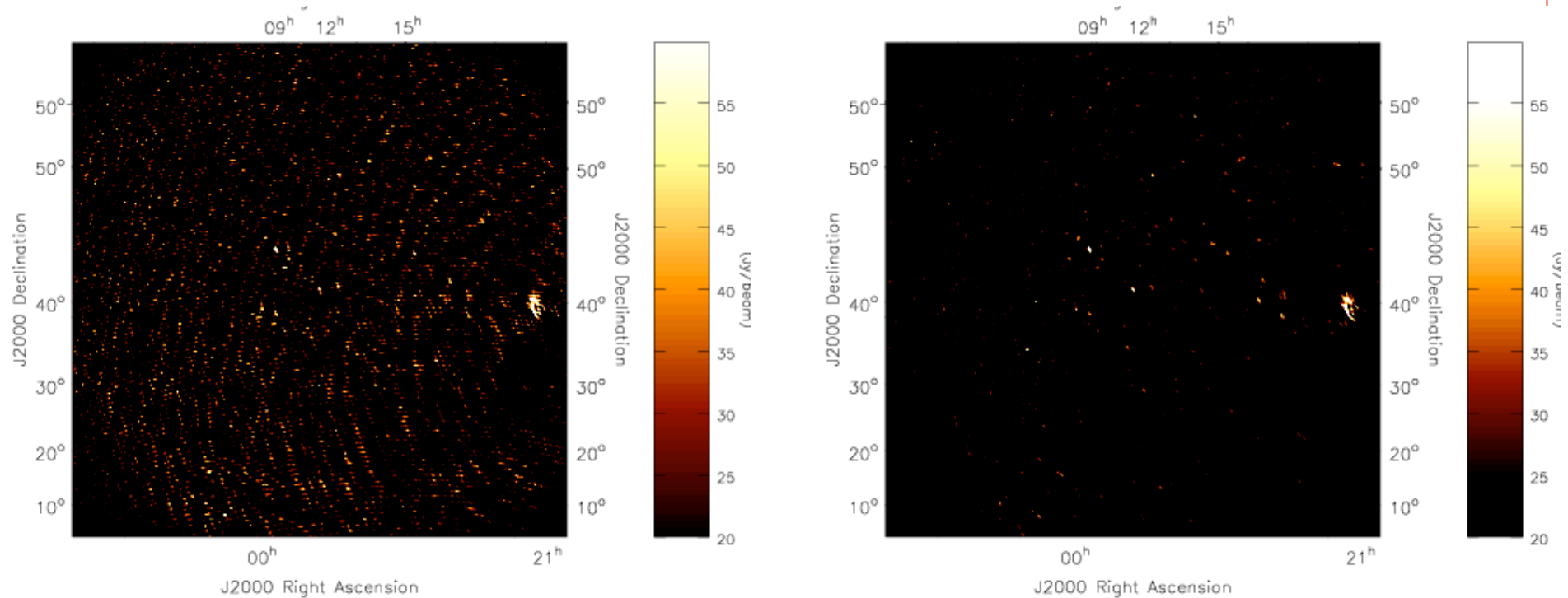
- MS1810, SB20
- Channel 32-39
(BW 4.8 KHz)
- Time used 8 hrs
(from start)!!!
- *uvw* during solv
(same CS1)
- CasA and CygA
subtracted,
Corrected->CasA
- Tycho (155 Jy)
- rms ~ 14 Jy (?)

Tycho
CasA remnant
CygA remnant



10 iteration, No MMSE

BBS - Which one is Better



Flipped uvw

Peak (Tycho/rms) = 8

uvw Same as CS1

Peak (Tycho/rms) = 11

Same scale -> Second Image looks better

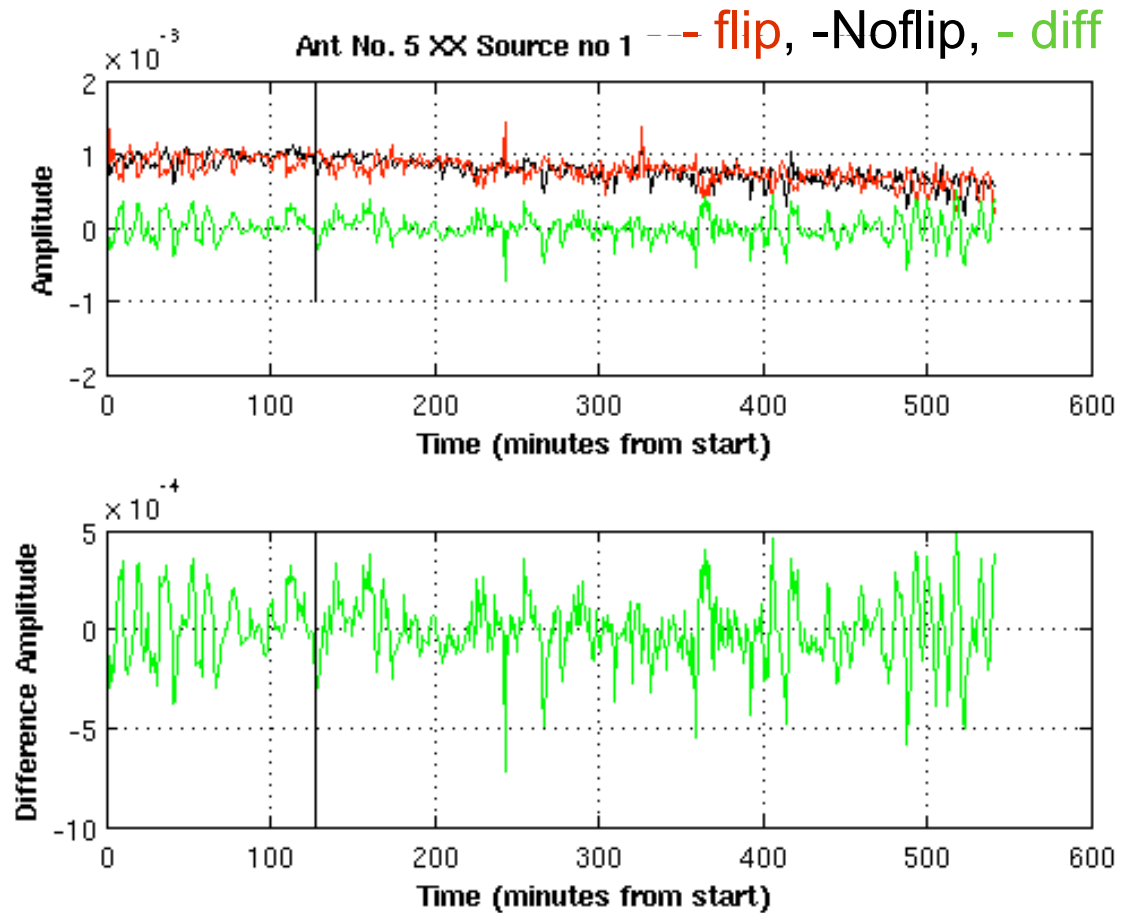
The First one is more noisy!!

More analysis needed!! -> Compare solutions !

BBS - solution compare - flip/no flip

Towards CasA

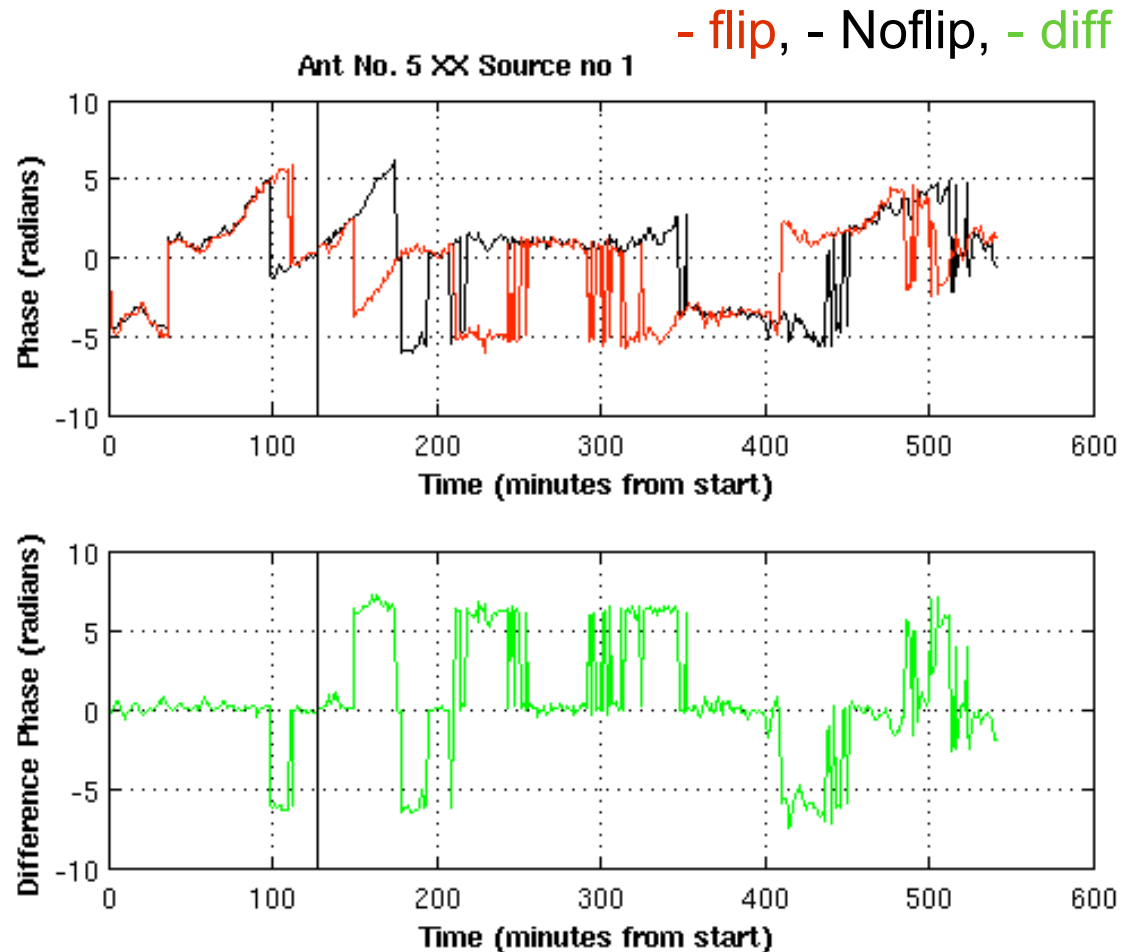
- Antenna 5 (XX),
- **Amplitude** (CasA) (G11)
- Similar structure/Pattern (Expected)



BBS - solution compare

Towards CasA

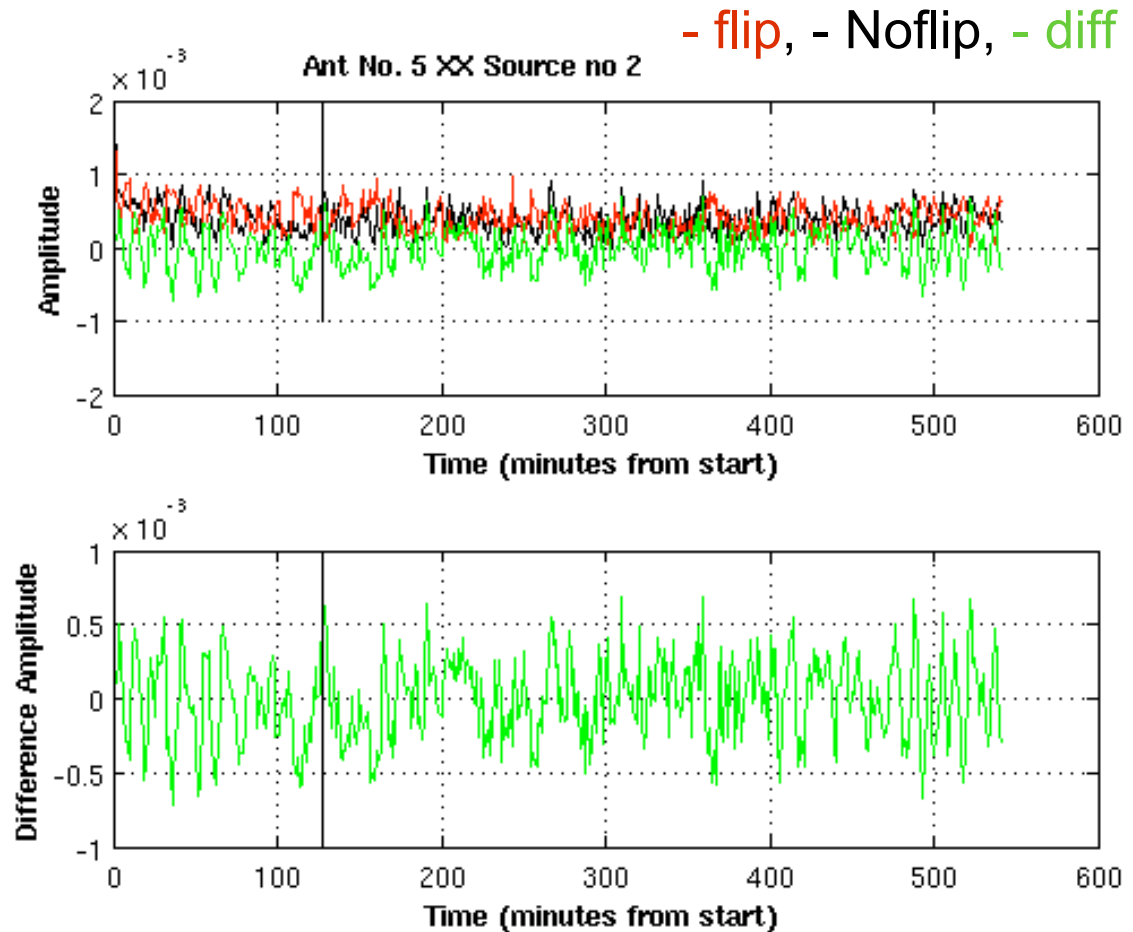
- Antenna 5 (XX),
- **Phase** (CasA) (G11)
- Similar structure/Pattern (Expected)



BBS - solution compare

Towards CygA

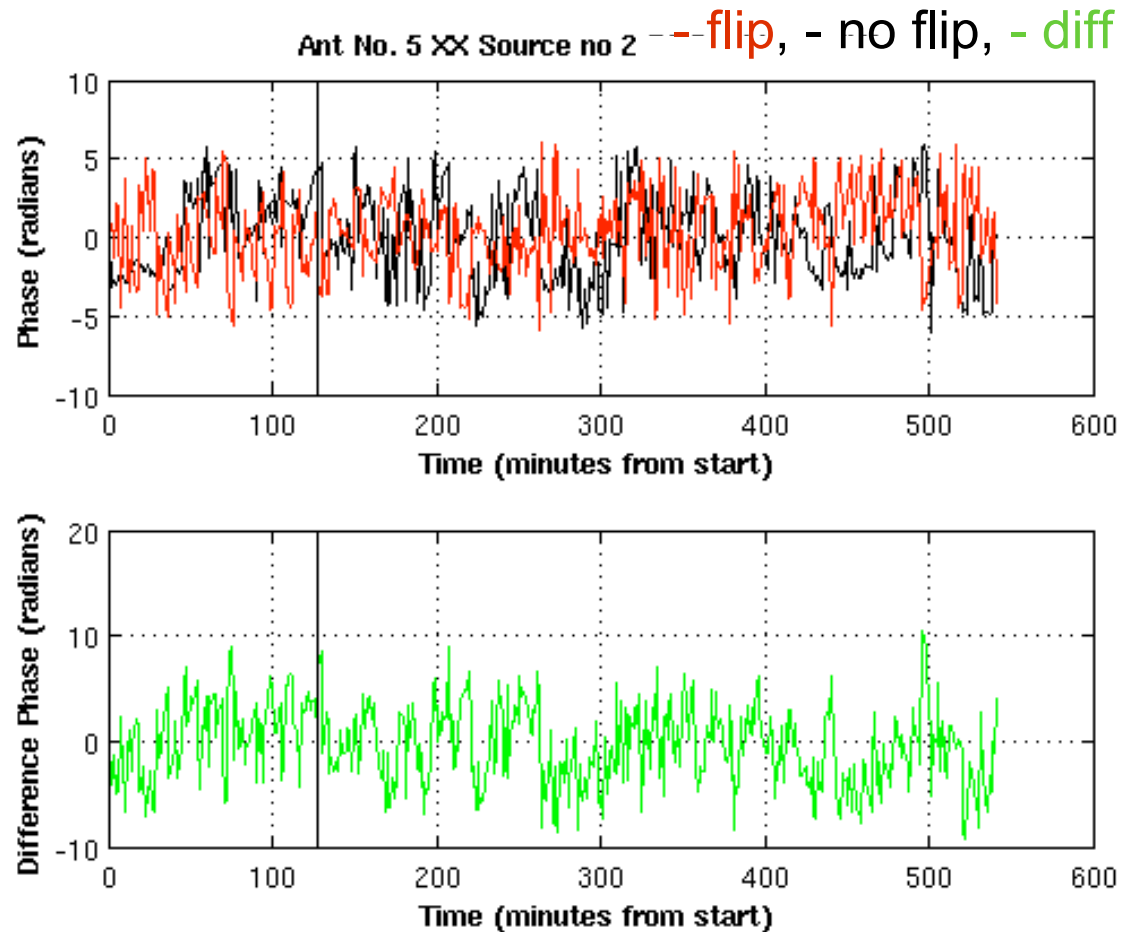
- Antenna 5 (XX),
- **Amplitude** (CygA) (G11)
- NonSimilar Pattern



BBS - solution compare

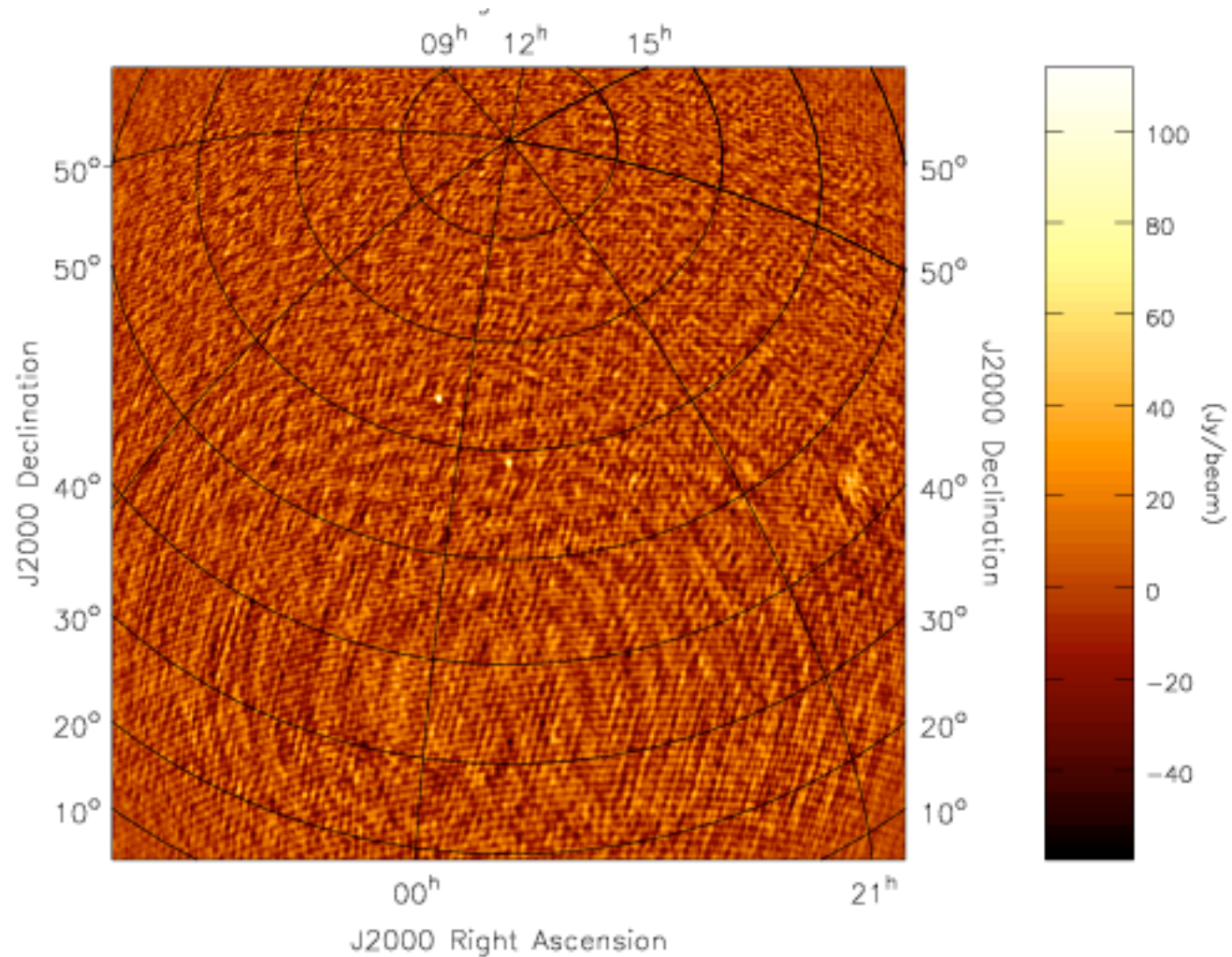
Towards CygA

- Antenna 5 (XX),
- **Phase** (CasA) (G11)
- Dis-Similar Pattern
- Although very noisy, without flip is more stable?



BBS-Image

- MS1810, SB20
- Channel 32-39
(BW 4.8 KHz)
- Time used 16
hrs (from start)
- *uvw* during solv
(flipped wrt CS1)
- CasA and CygA
subtracted,
corrected-> CasA
- Tycho (114 Jy)
- rms ~ 13 Jy (?)



No MMSE, 10 iteration

Conclusions -Open issues/ Next steps

- **We verified all four BBS stages - predict, solve, correct and subtract on simulated data. (both XX and YY polarization)**
- **Our comparison of BBS solution with MeqTree solutions match well**
- **We have obtained our first image using BBS calibration.!**
- **Image even with flipped uvw ?? WHY? Look away from Phase Center**
- **Image without any flip in uvw seems to be better (should be !!)**
- **Increase the speed of BBS, Use more data to calibrate, Distributed !**
- **Simulated Data - Add Noise, introduce polarization, check !**
- **Introduce effect of dipole Beam, -> Interpretation !**
- **Optimal flagging!! (important in reducing misinterpretation!)**
- **More detailed analysis needed !! - compare soln as a function of freq, subtract adjacent channel images. Posn and fluxes with other catalogs !!**

!! Thank you !!