Commissioning results for DDRG 1835+62

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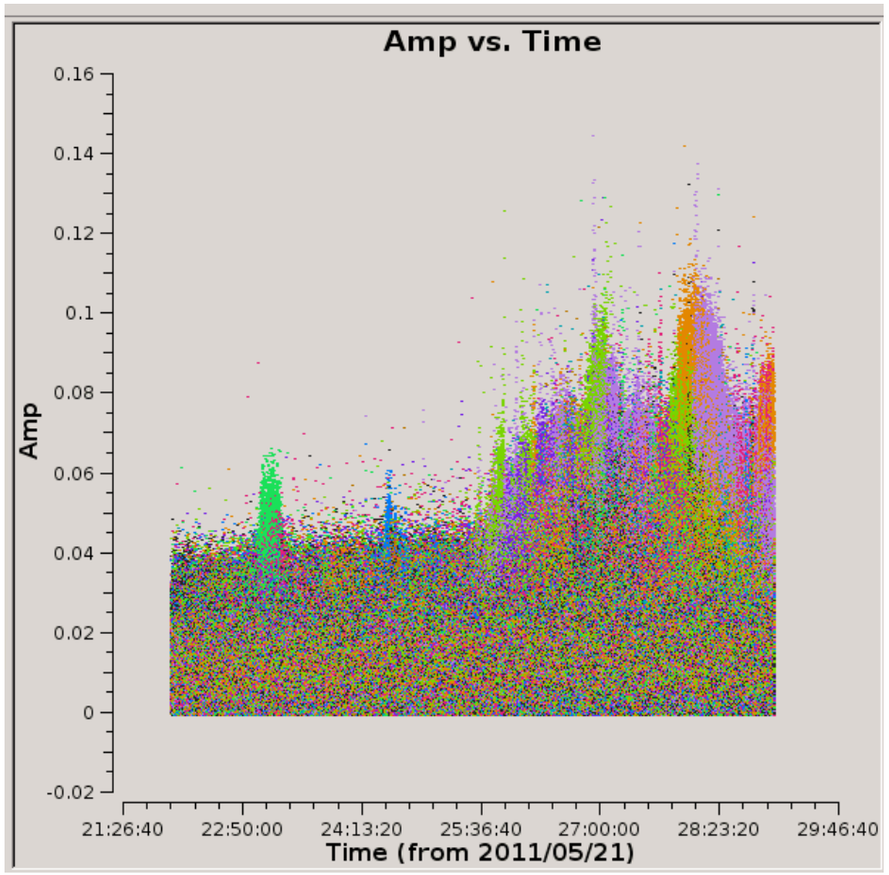
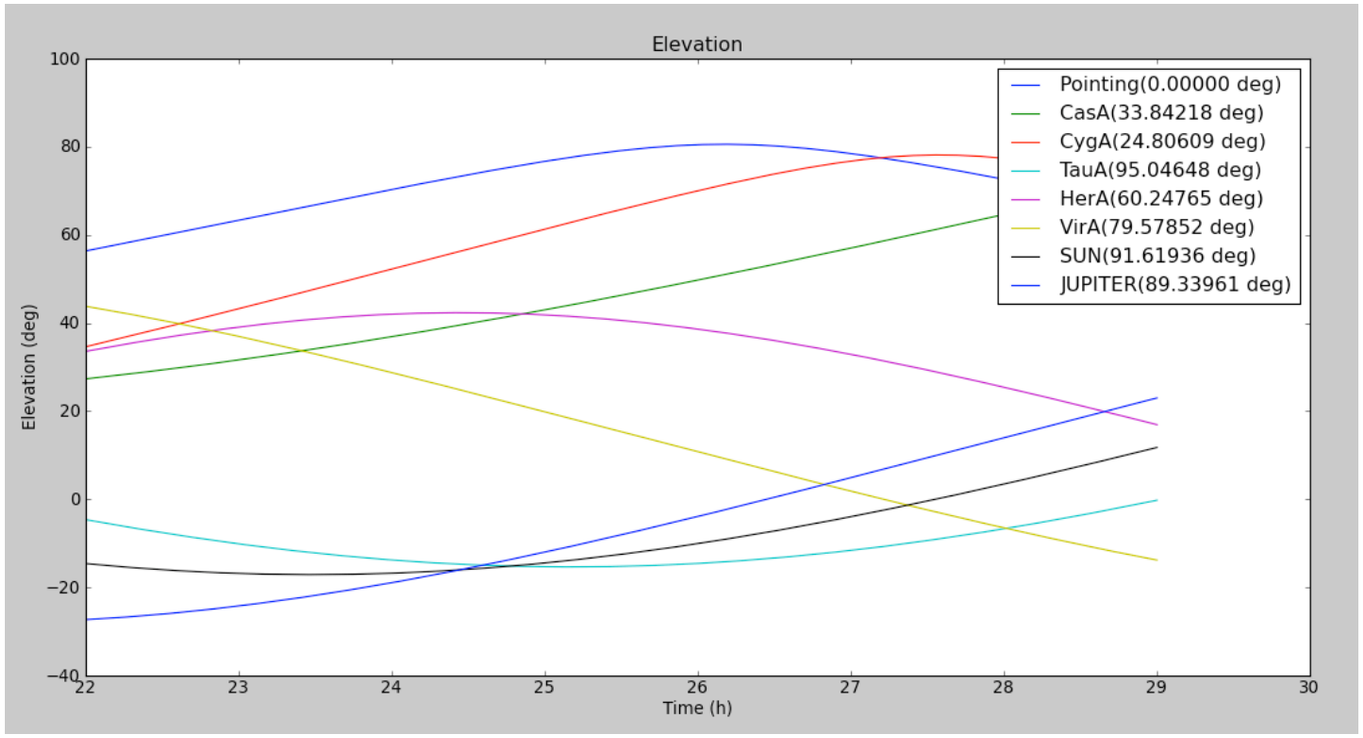
collaborators: R. Pizzo, S. Yatawatta, G. de Bruyn
& Lofar commissioners

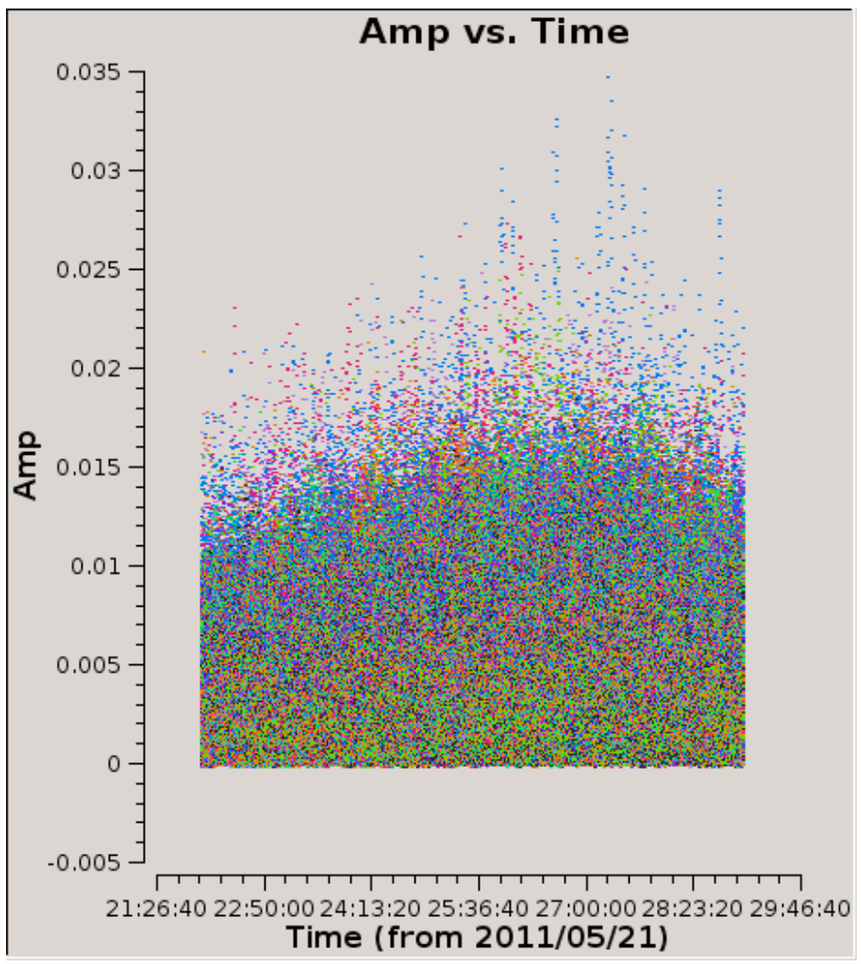
commissioning goal

- compare fluxes between bbs and sagecal
- detect polarized emission using RMsynthesis



- 21-22 May-2011: 7h
- HBA freq. ~ 140 MHz
- 44 antennas 1DE flagged + one with no data recorded
- 162 SB
- after demix CasA CygA avg to one ch

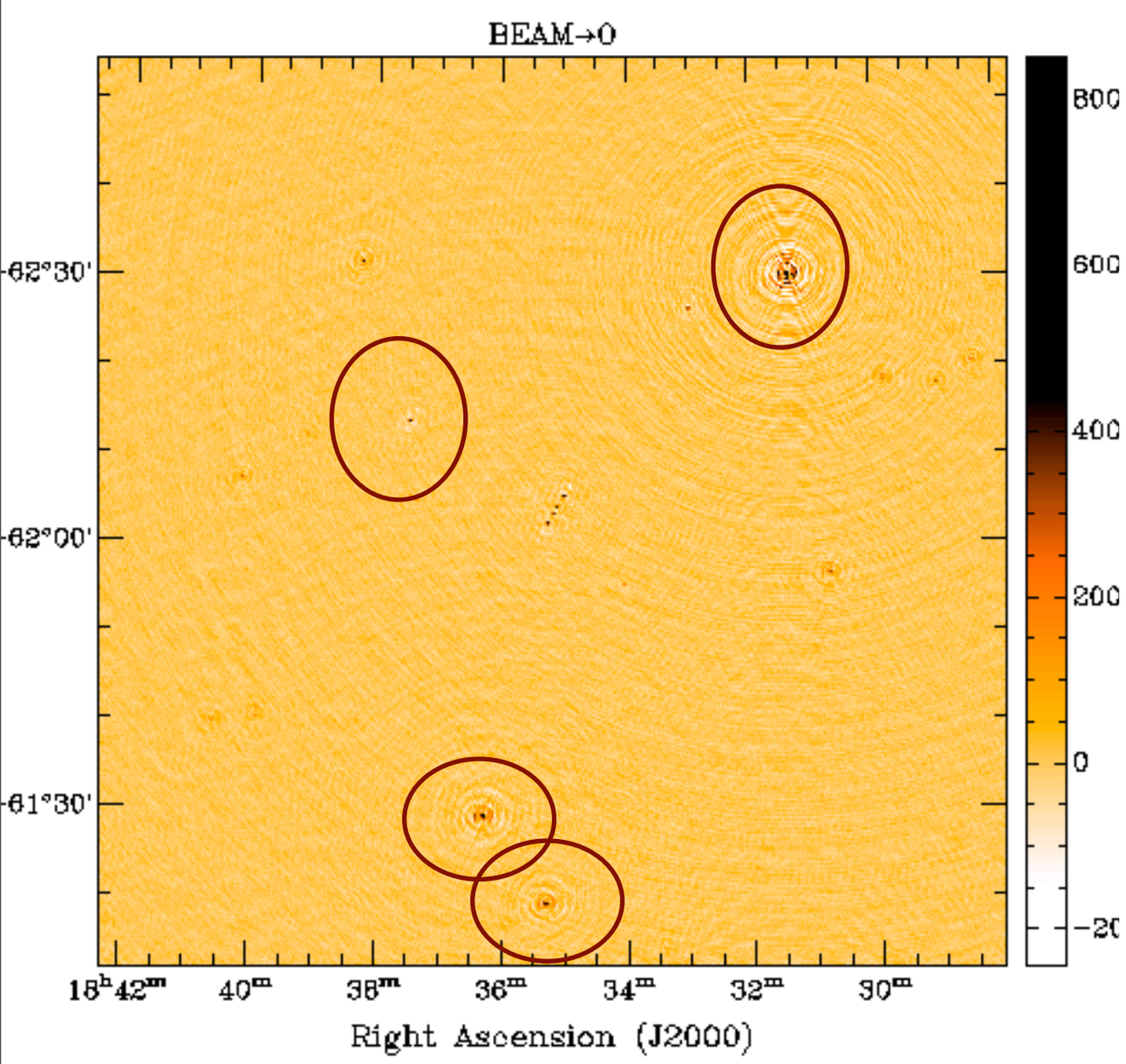


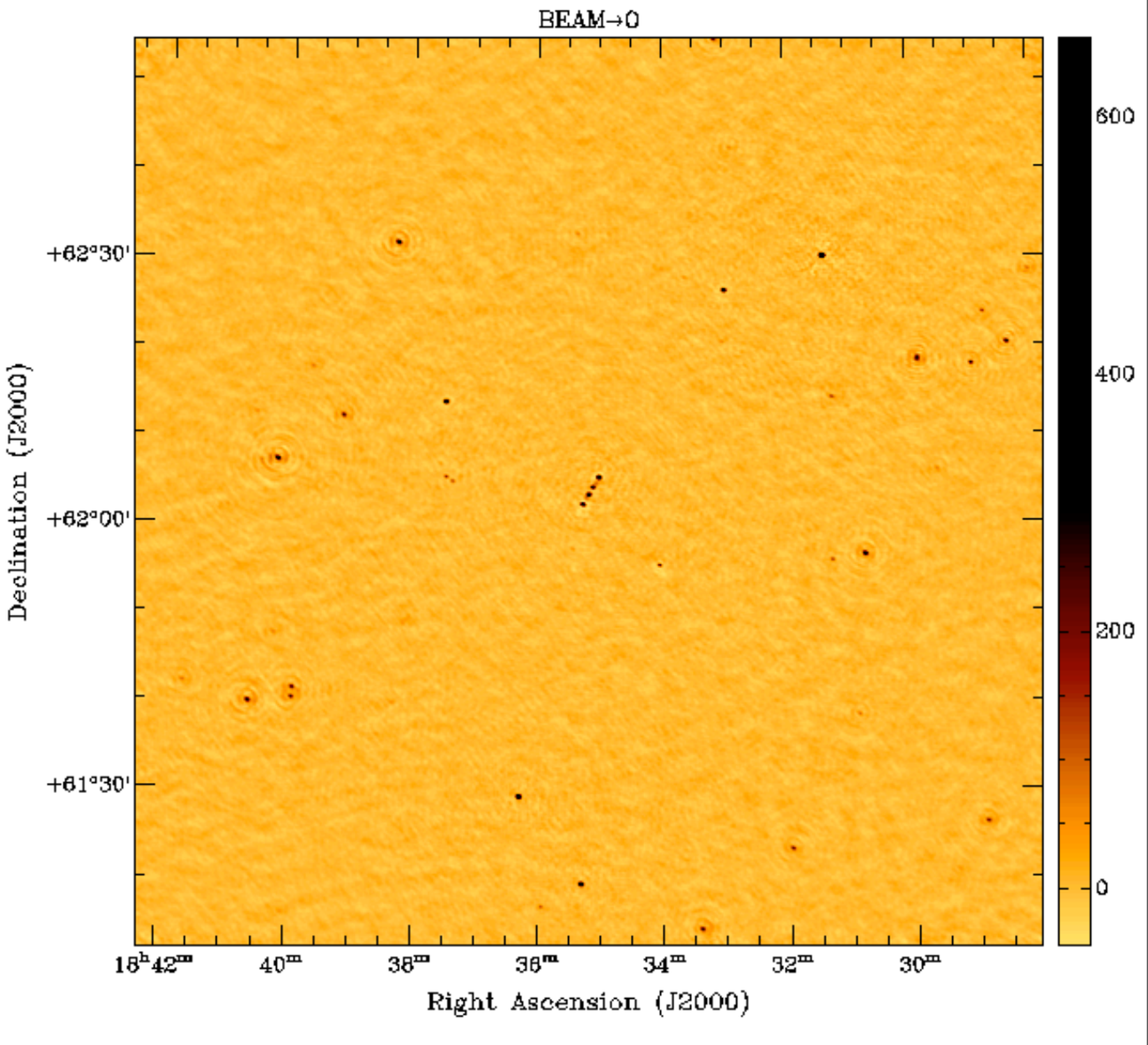


Calibration & Imaging

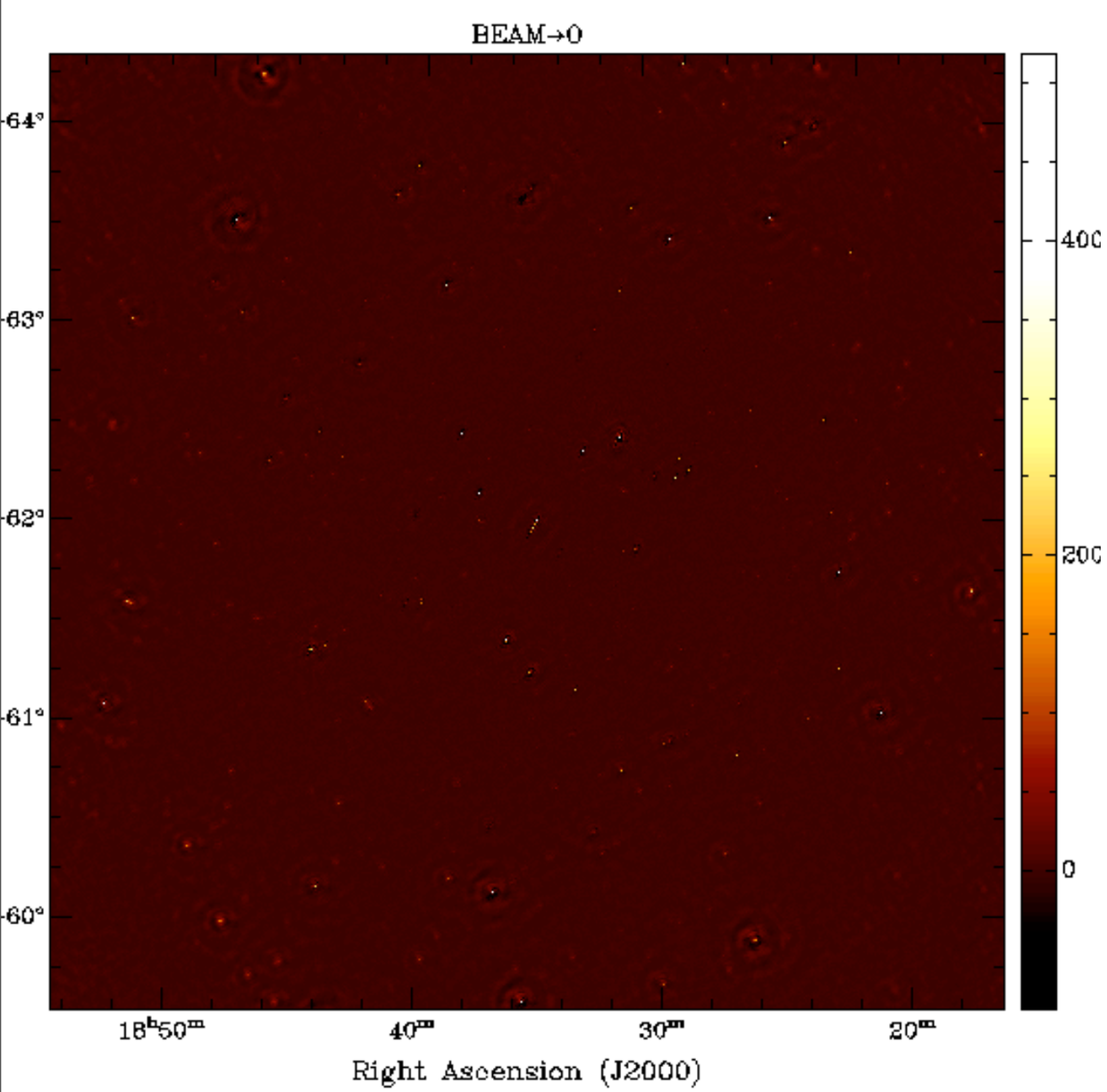
- BBS (CEP2_RO): Model WSRT @ 150 MHz extracted with Pybdsm $\alpha = -0.8$ (courtesy of G. de Bruyn)
- imaging Awimager (CEP1)
- imaging casapy no-deconvolution for RMsynthesis cube
- sagecal.hd: Model from BBS calibrated image with spectral info LOFAR bw, DDE corrections in 25 direction (CEP1/COMA RU Nijmegen)
- imaging Awimager (COMA RU Nijmegen)

before and after

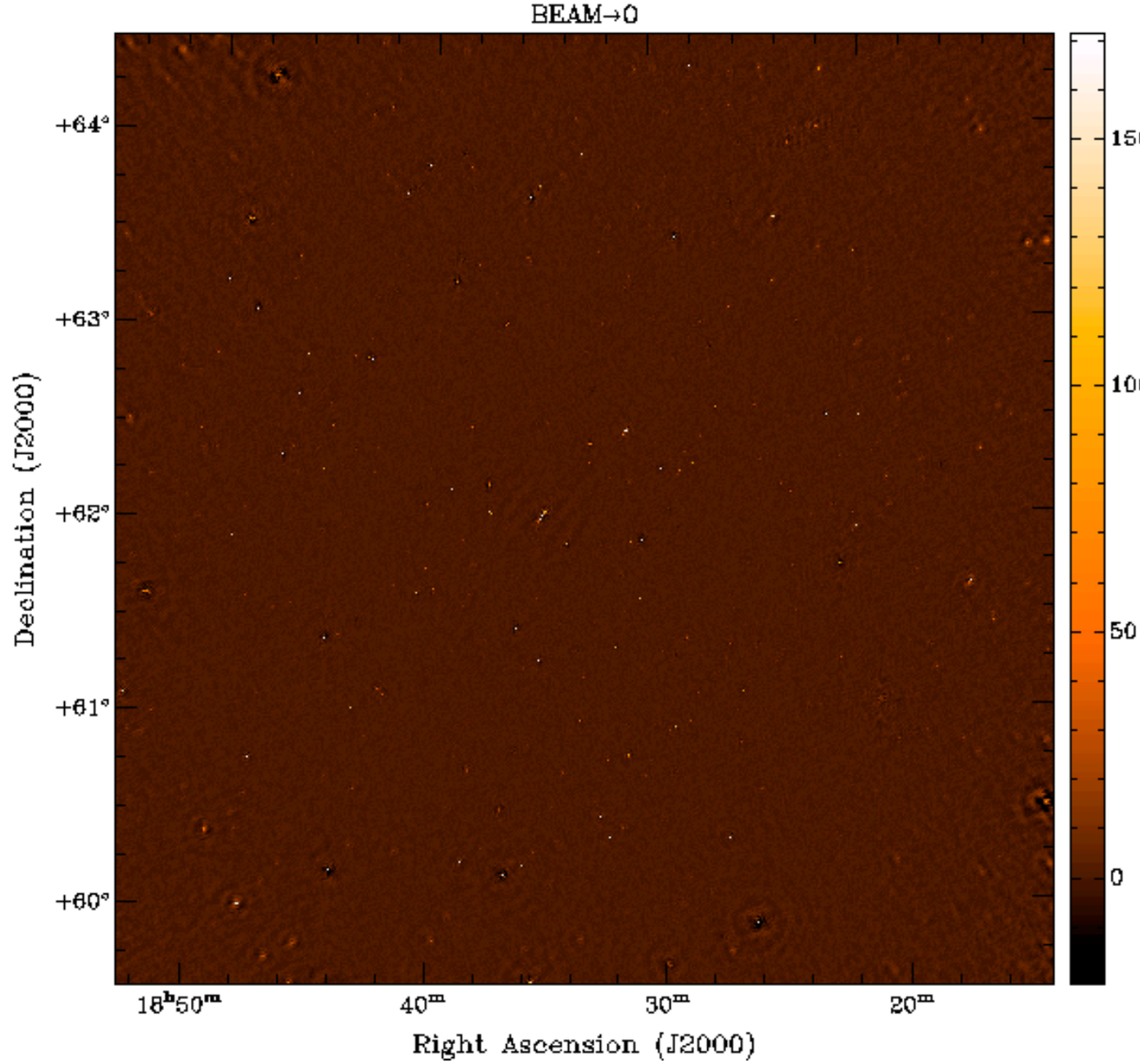




full band



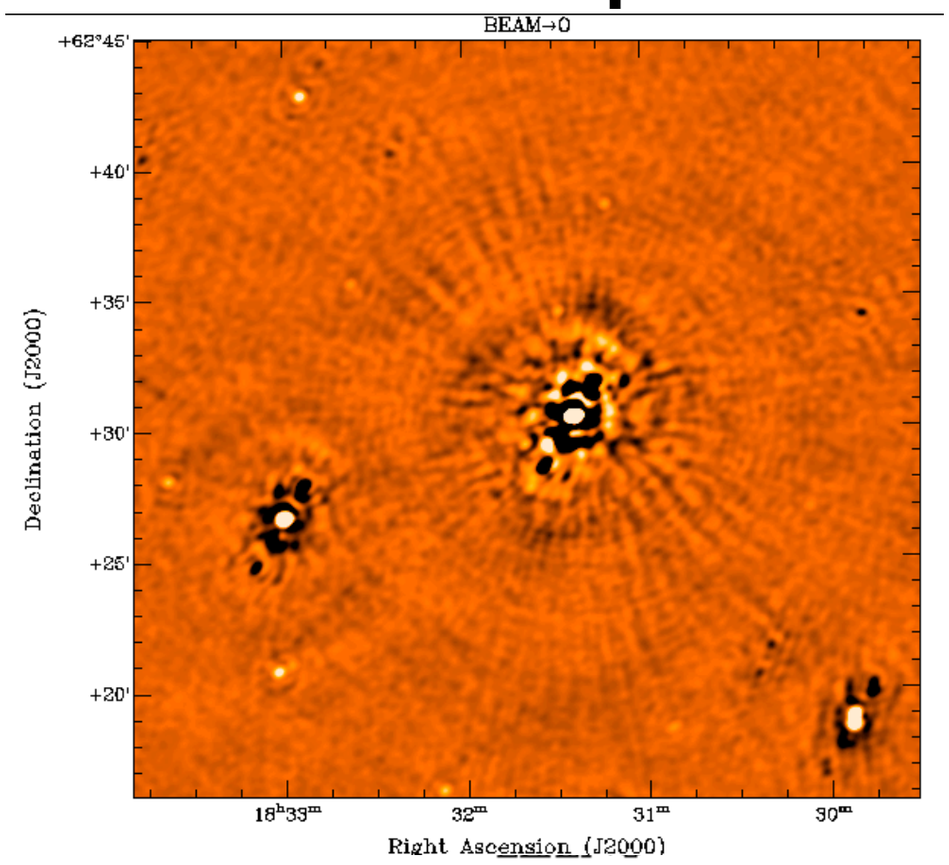
rms=1.2 mJy/beam

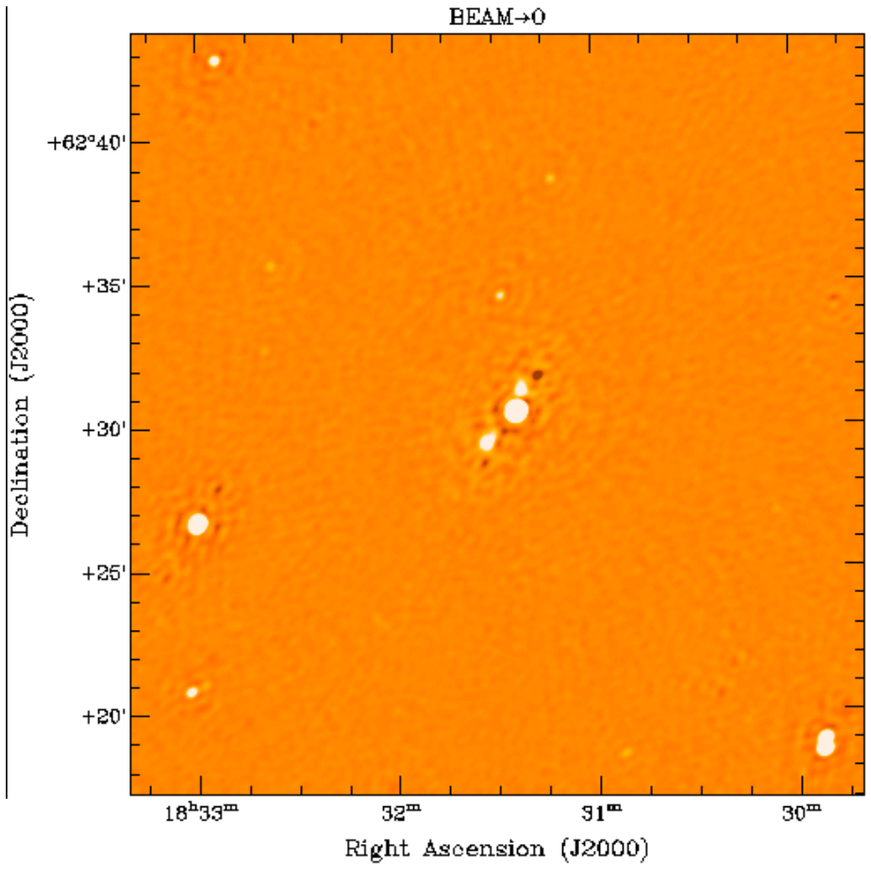


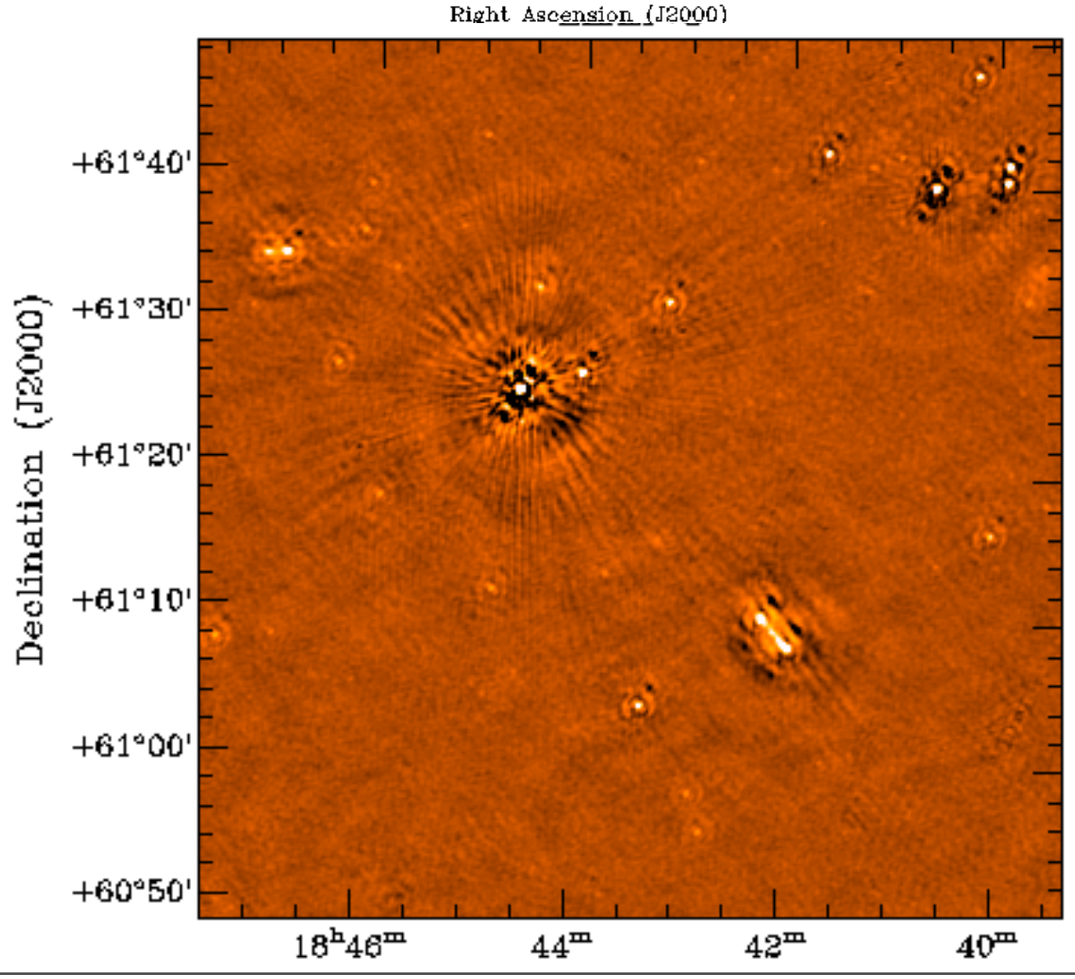
rms=0.8 mJy/beam

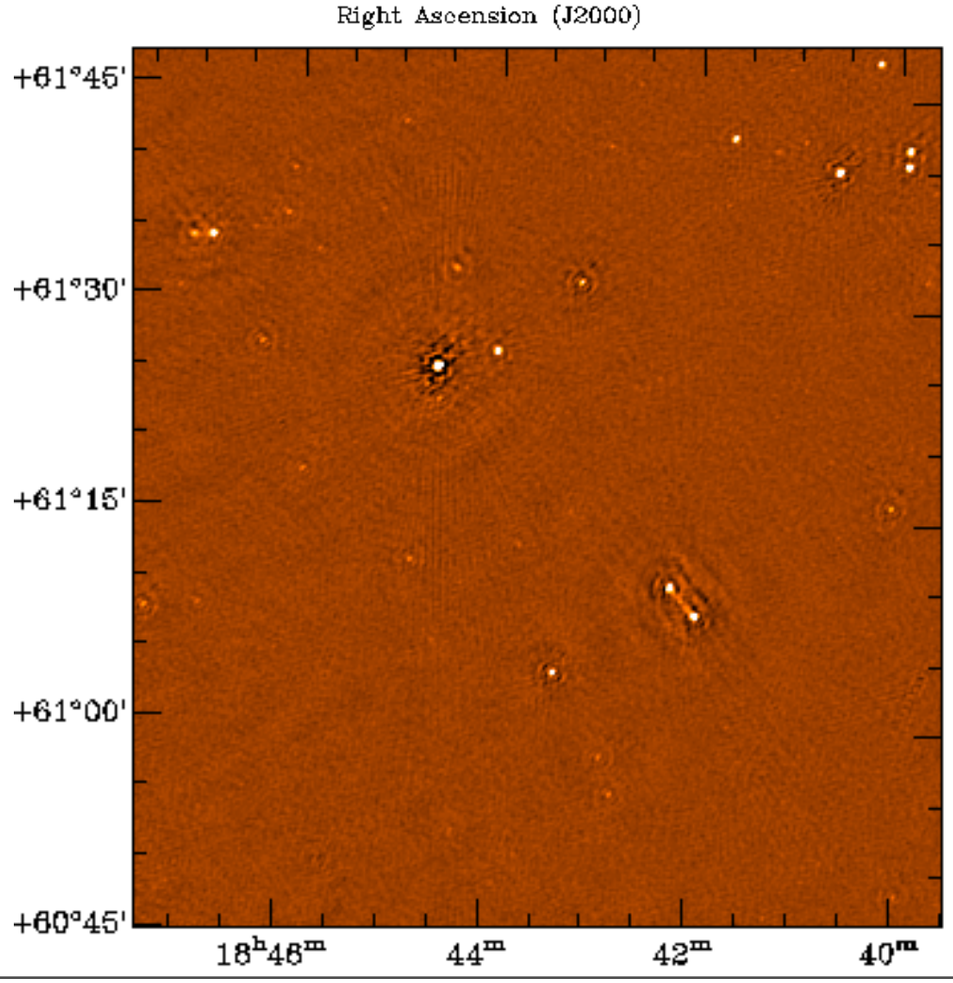
HBA 7 hrs BW = 31 MHz CS + RS res= $24'' \times 21''$

ionosphere+deconvolution errors

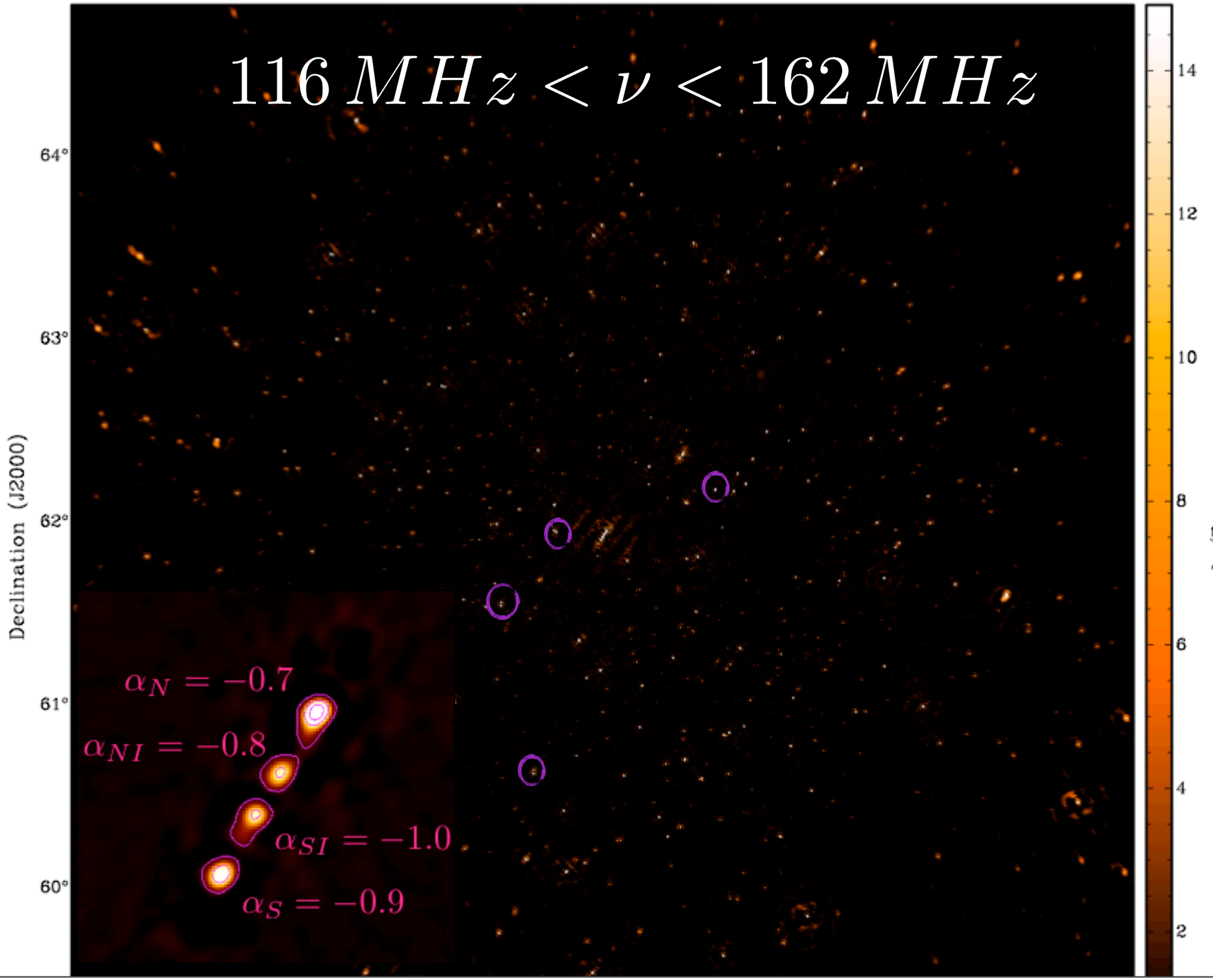






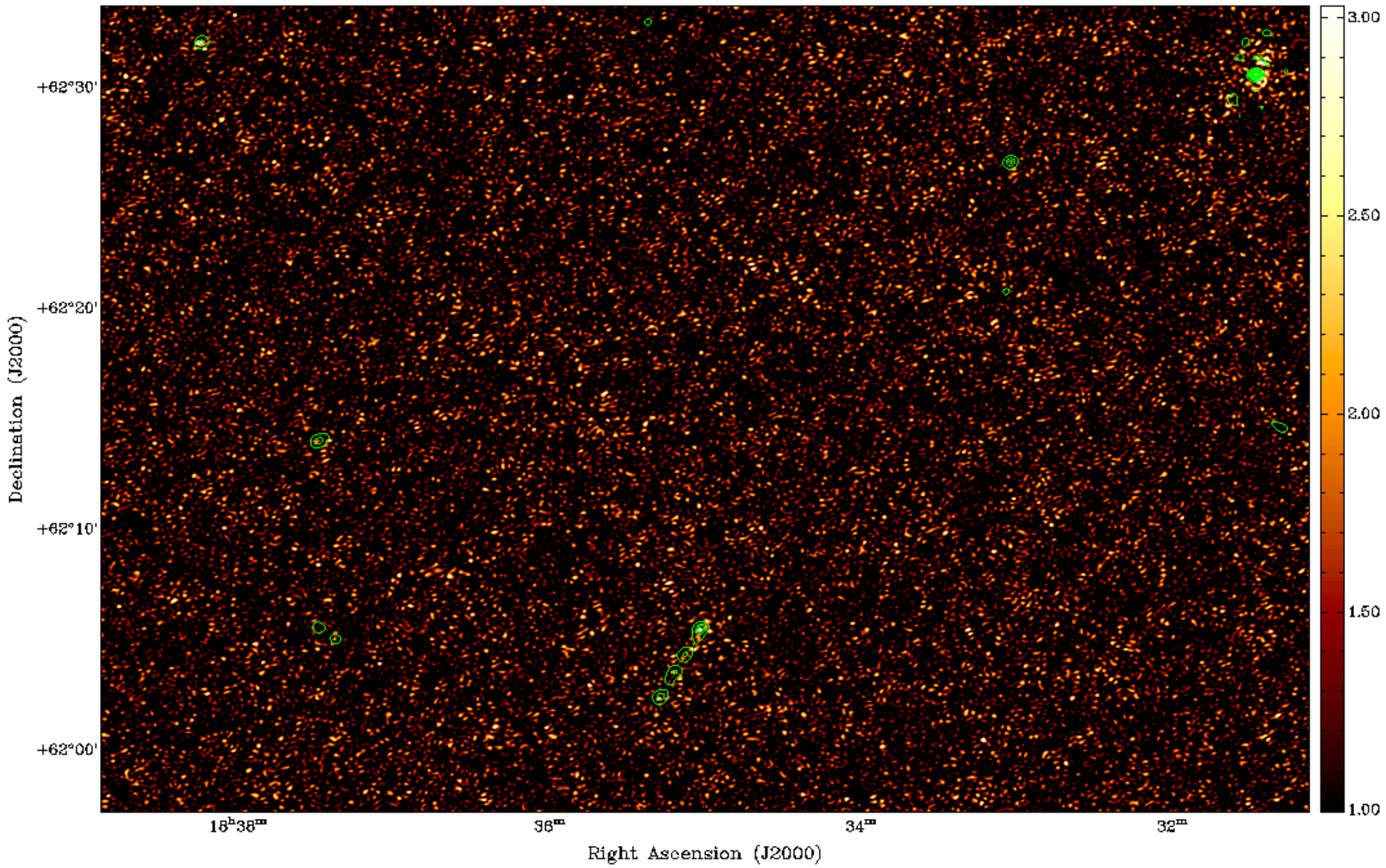


B1835+620 double-double RG field



Phi: 0.000000e+00

$-100\,rad\,m^{-2} < \phi < +100\,rad\,m^{-2}$



Phi: 0.000000e+00

BEAM→0 overlaid with BEAM→0

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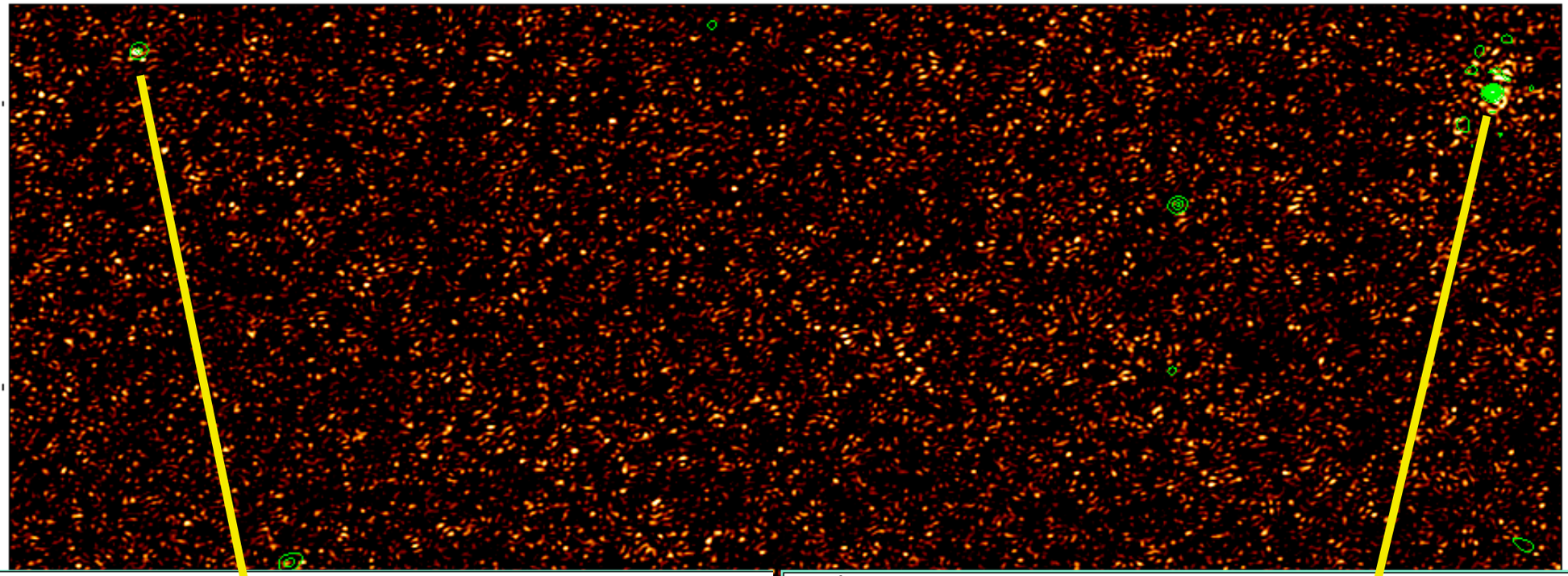
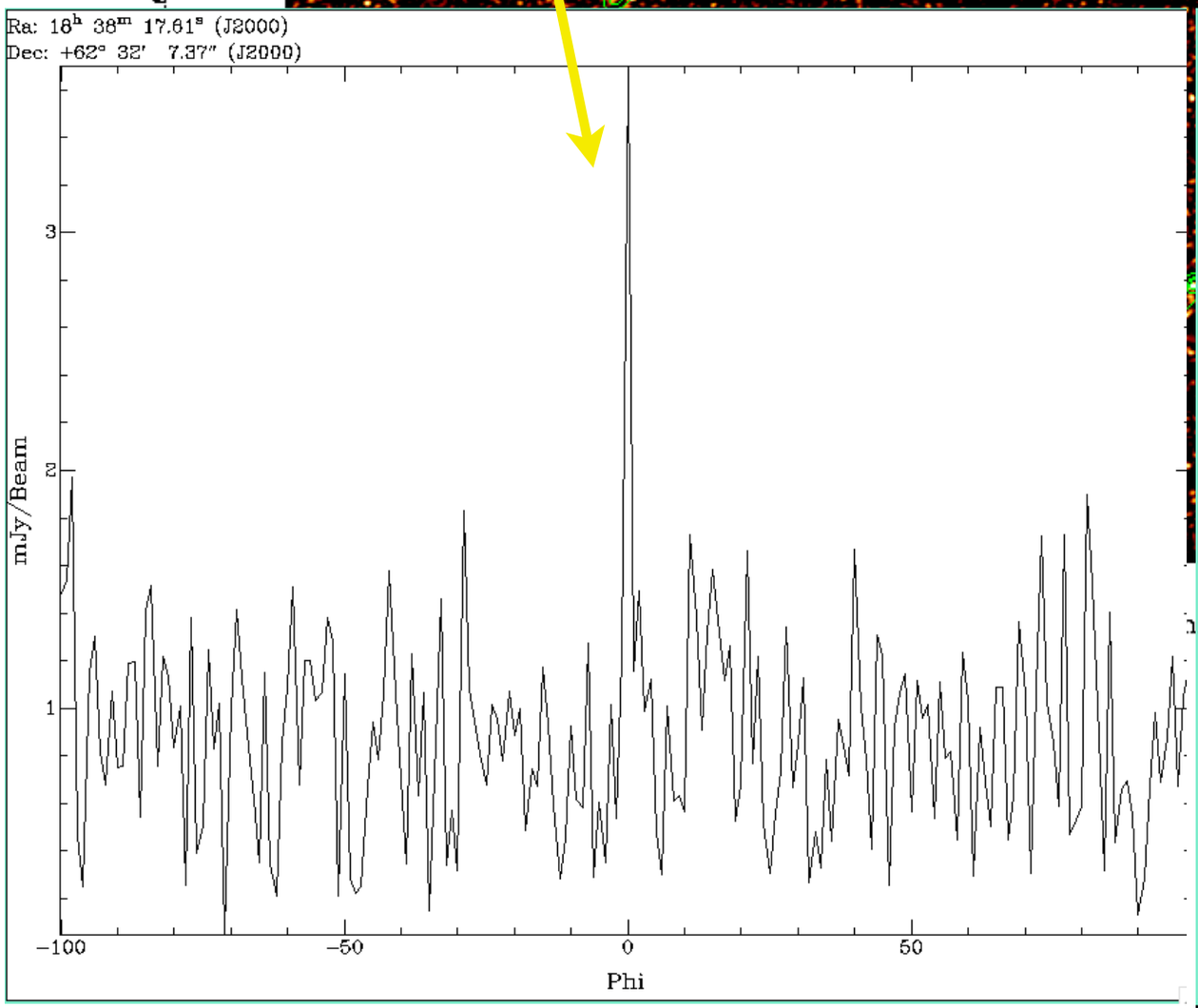
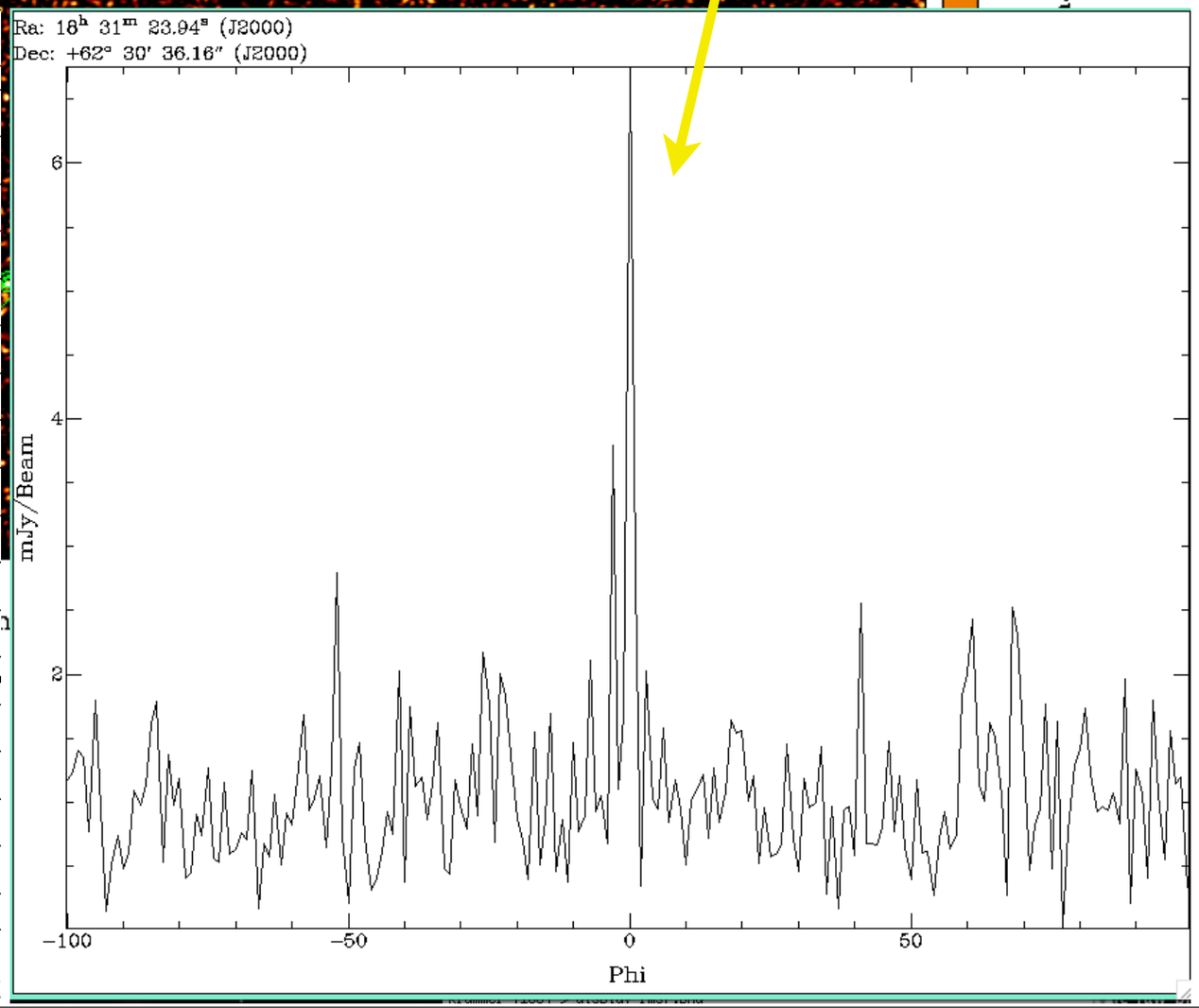
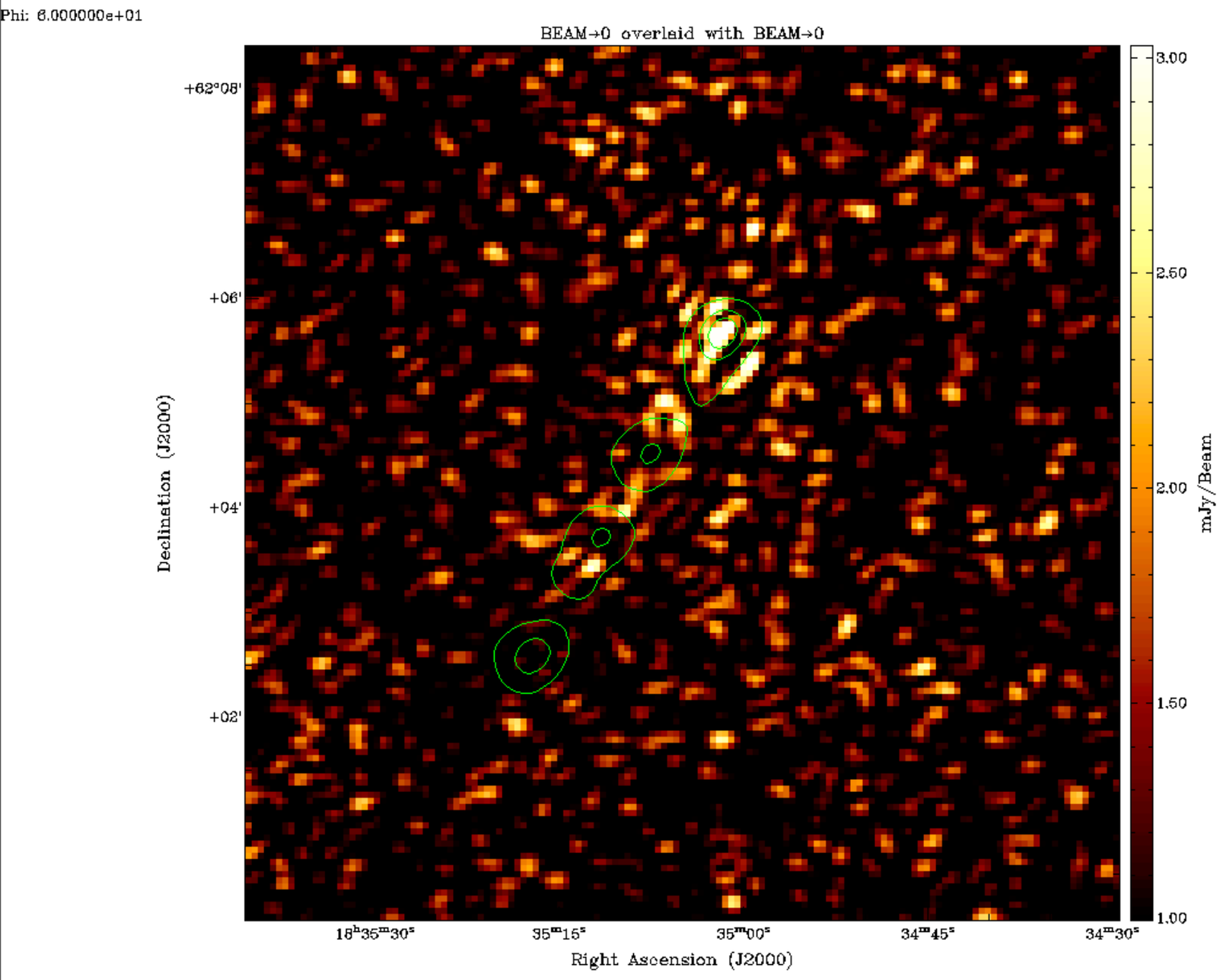






Detected polarized emission at $\phi = +60\, rad\, m^{-2}$

as in Schoenmakers et al. 2000



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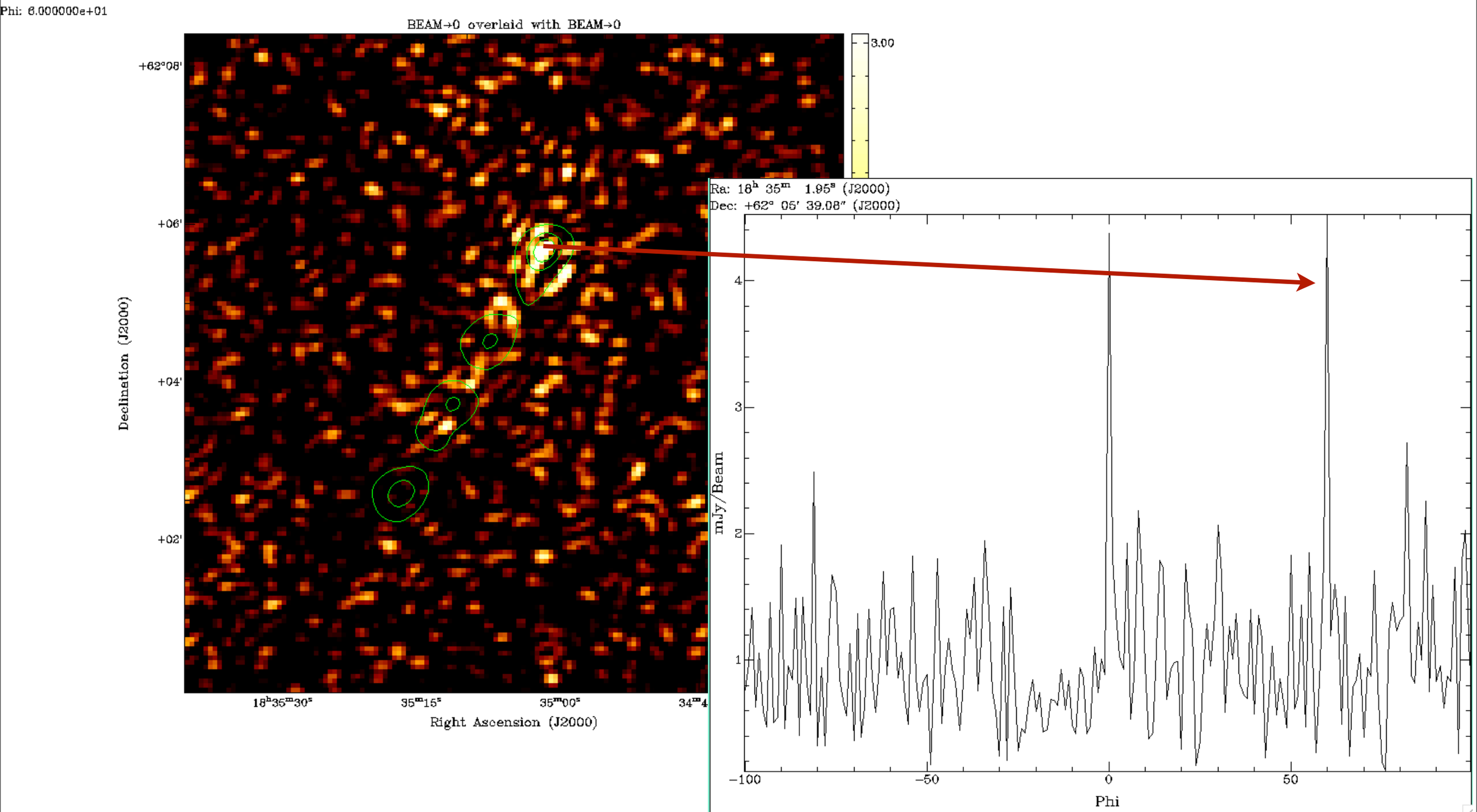
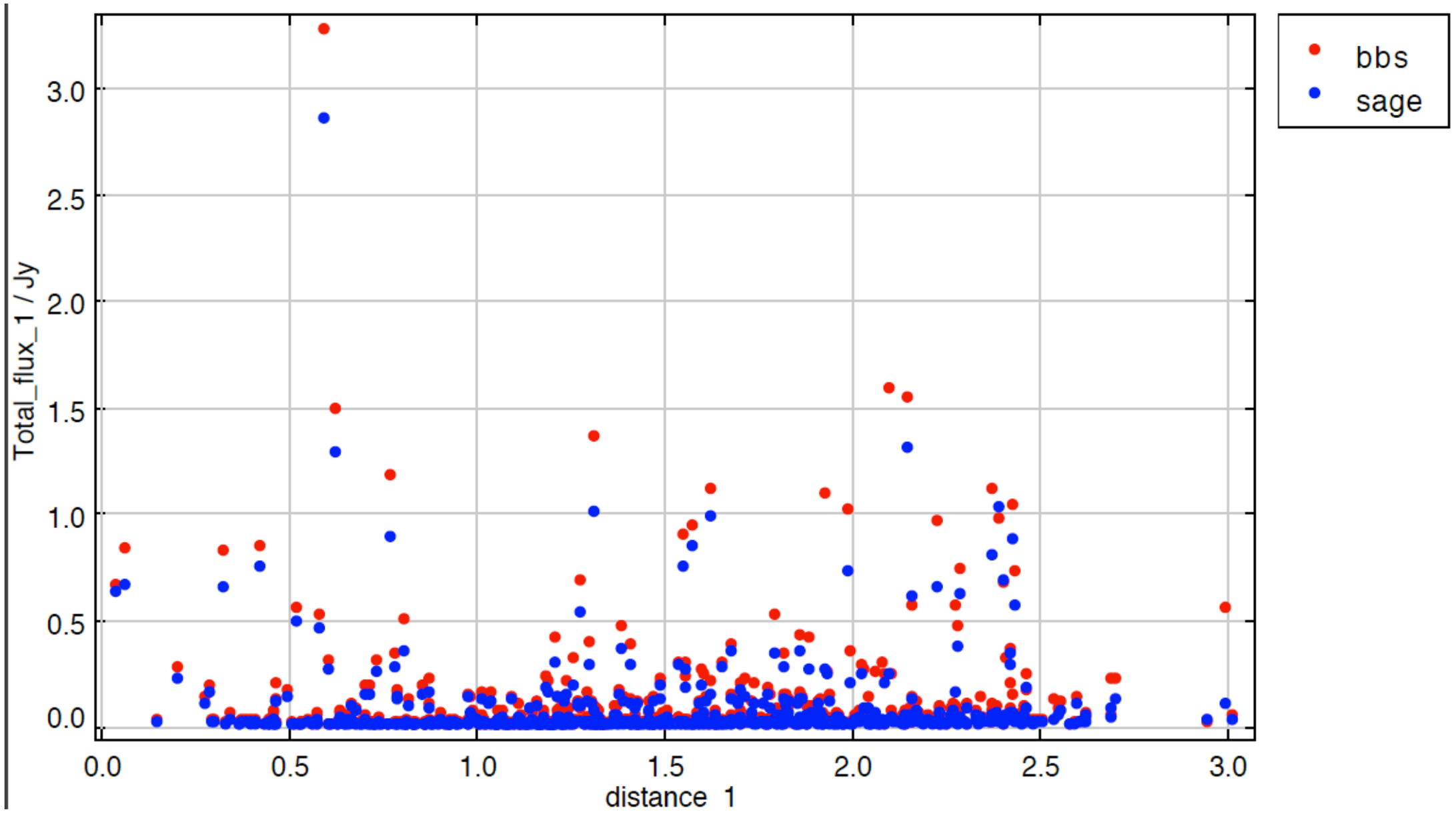


BBS vs SAGECAL: fluxes

- two catalogues produced with Pybdsm advanced settings to avoid artifacts



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- bbs 846 srcs and sage 1059 srcs
- imaging awimage flux corrected
- different initial spectral info in model of BBS and sagecal.
- self-cal bias? DDE bias? if true we should observe the same with BBS self-cal

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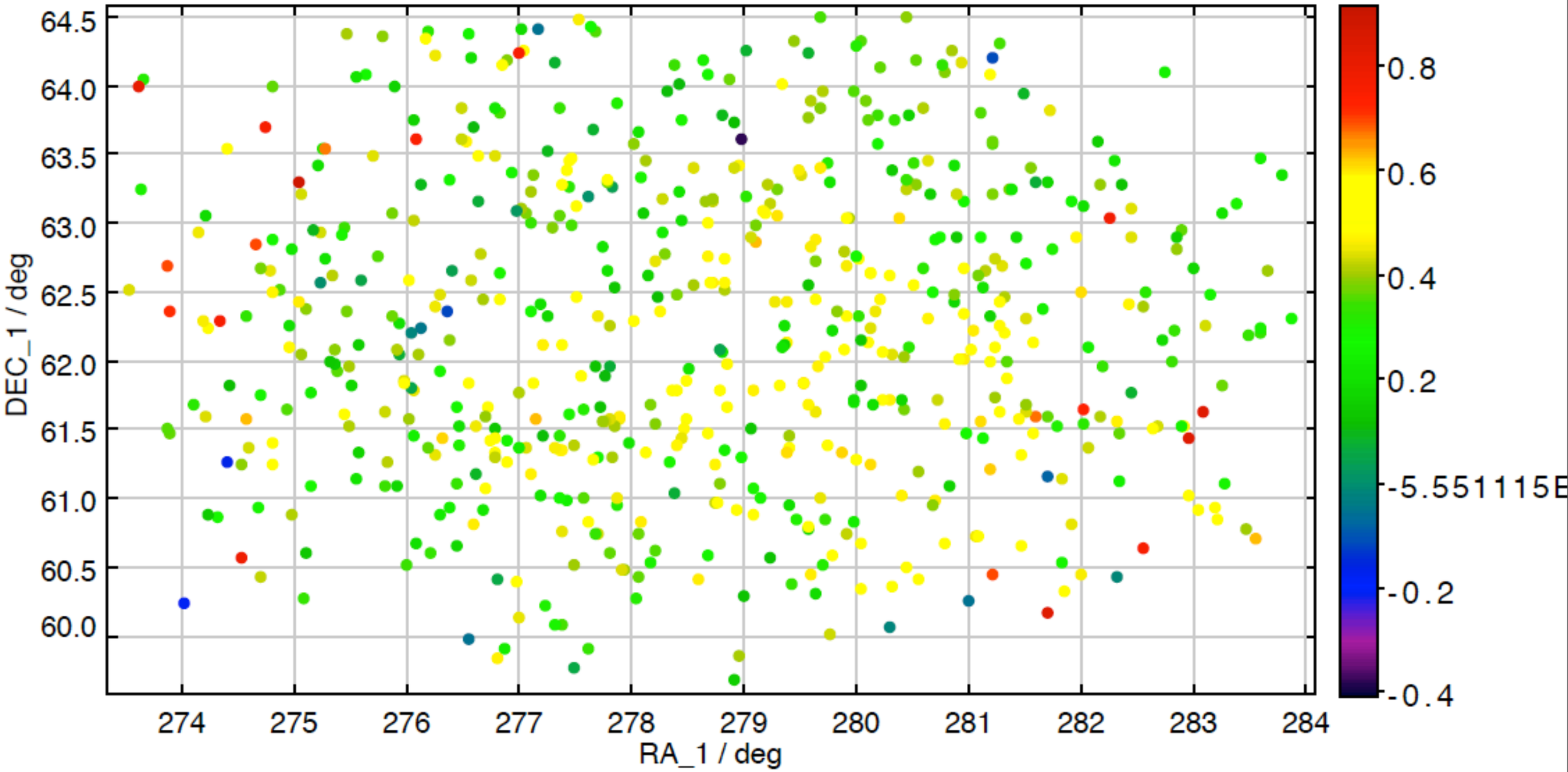

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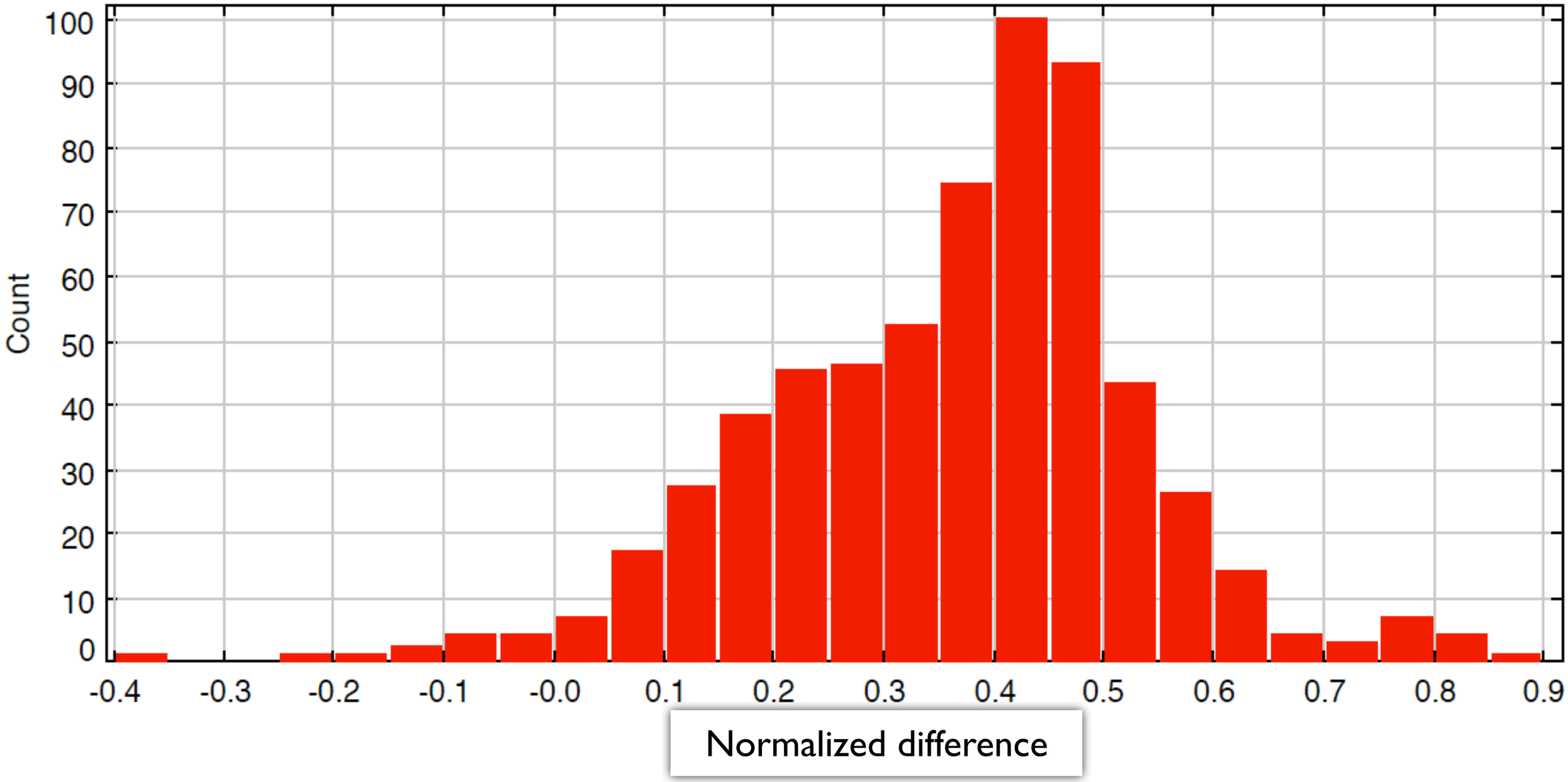

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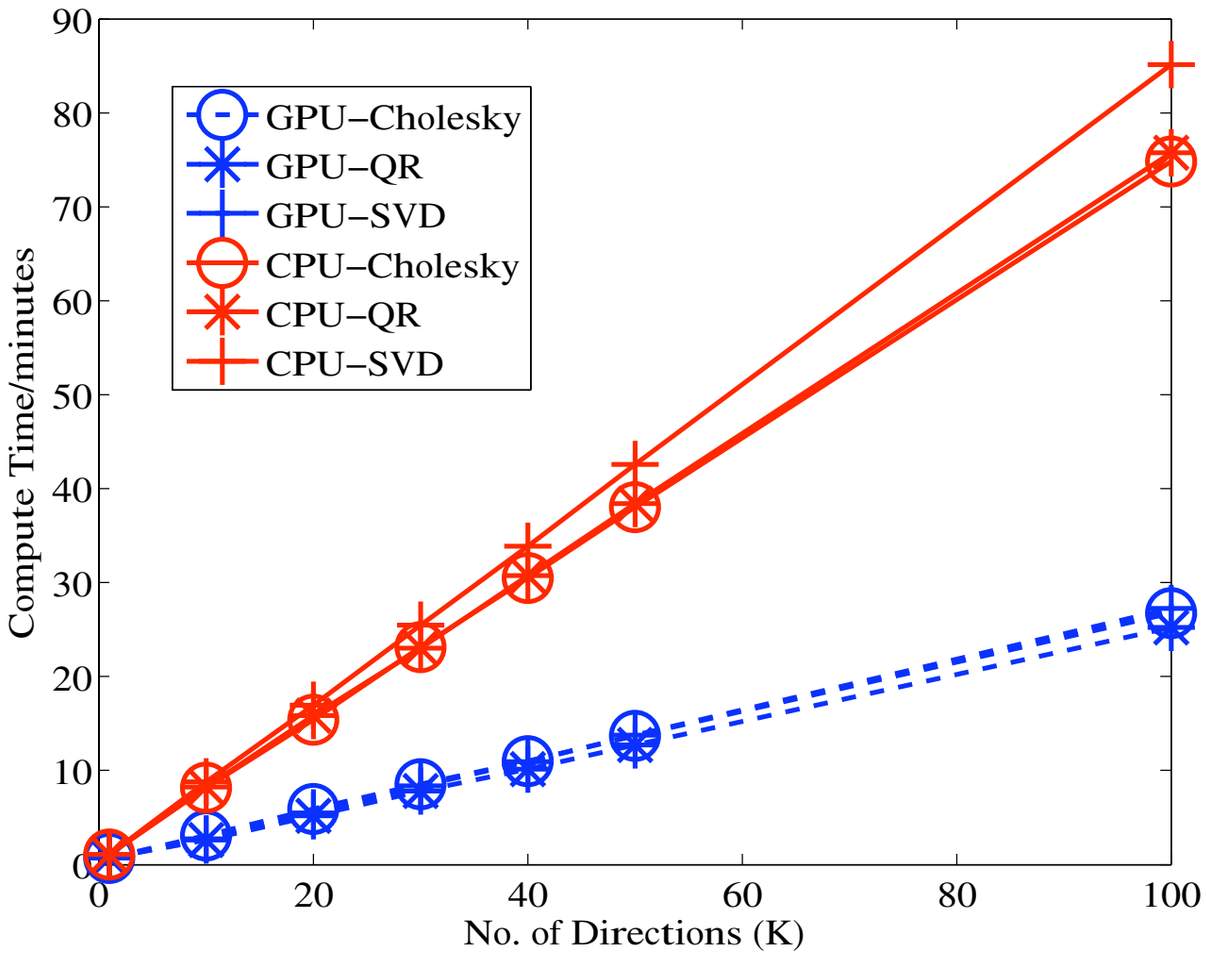
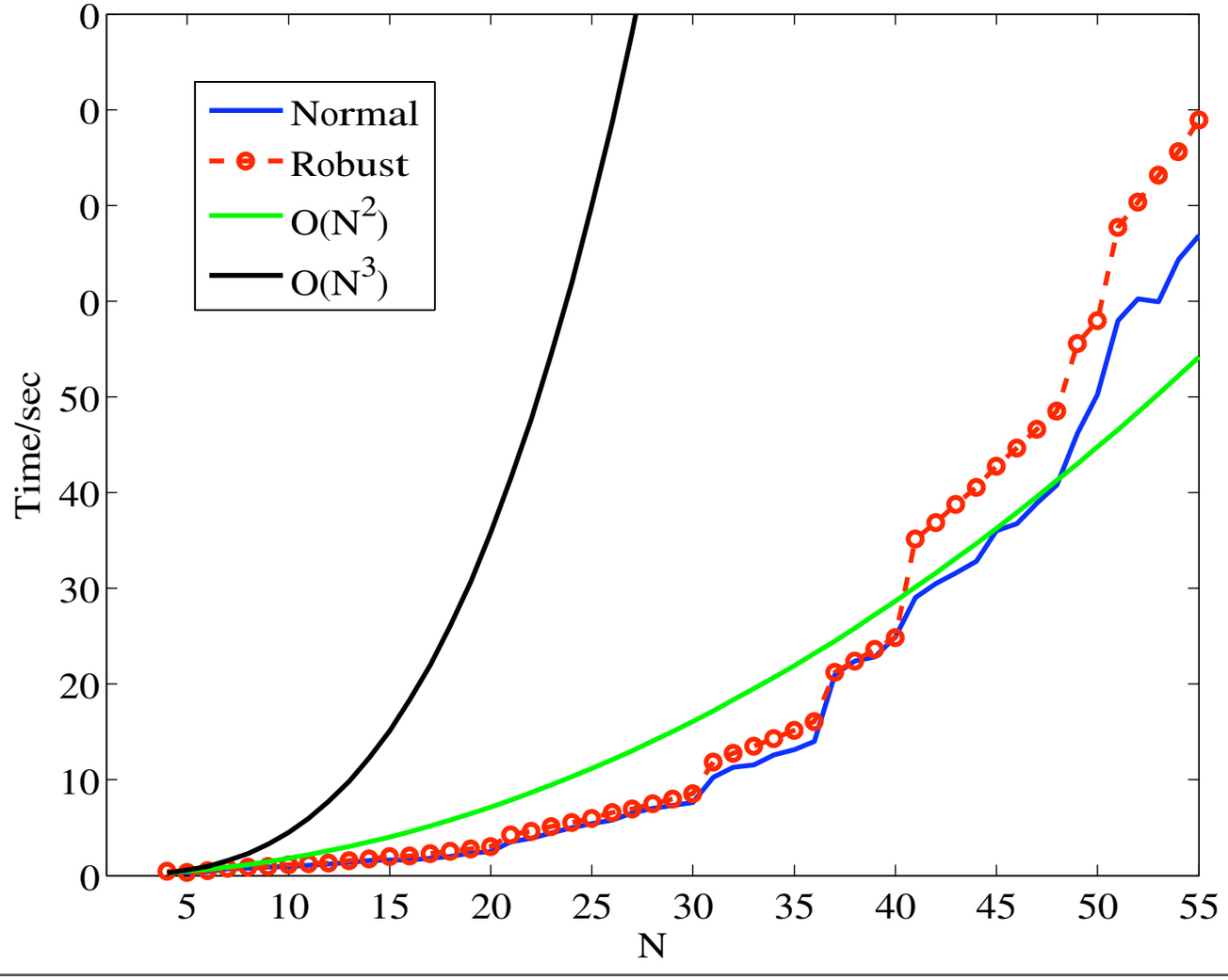
sagecal computing time



vs number of directions

vs number of stations



see Kazemi et al., IEEE ICASSP 2012

Conclusion

- produced image of B1835+620 wide field, close thermal noise
- polarized emission detected, % lower than expected, but RM agreement with literature
- flux difference bbs vs sagecal, need to evaluate inconsistencies and biases
- future: already observe with a flux calibrator and more long BL RSstations