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Building on New Worlds, New Horizons
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PAPER: STATUS AND RECENT OBSERVATIONS

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OUTLINE

- ✖ Current Status Update
 - + PGB-32 and PSA-32 arrays
- ✖ Recent Activities
 - + Sensitivity and Configuration Studies
 - + Calibration
- ✖ Imaging and cataloging

STATUS UPDATE



38:25:59.24 N
-79:51:02.1 W
Green Bank, WV

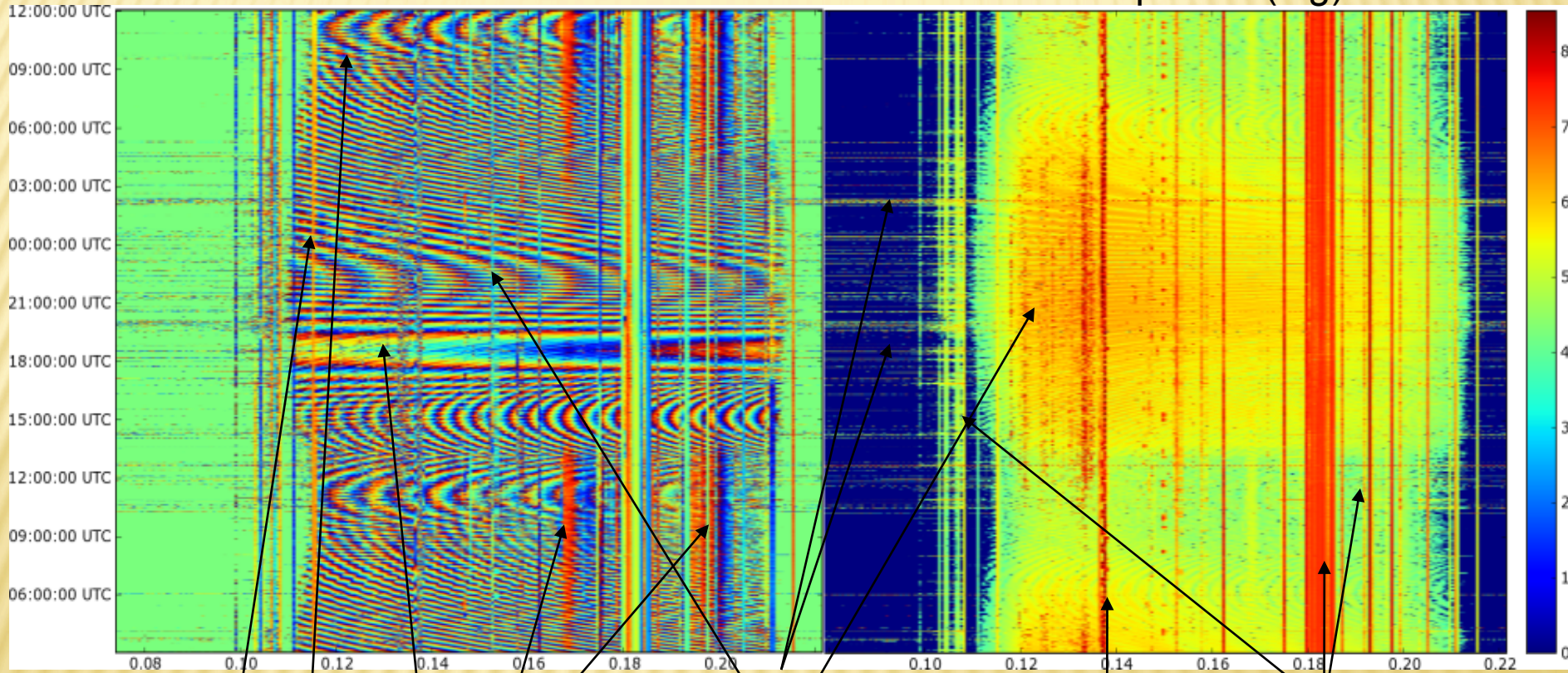


30:43:17.5 S
21:25:41.9 W
Karoo, ZA

PGB: 1 DAY, 1 BASELINE

Phase

Amplitude (log)



Fringes (Cas, Cyg, Sun)

Crosstalk

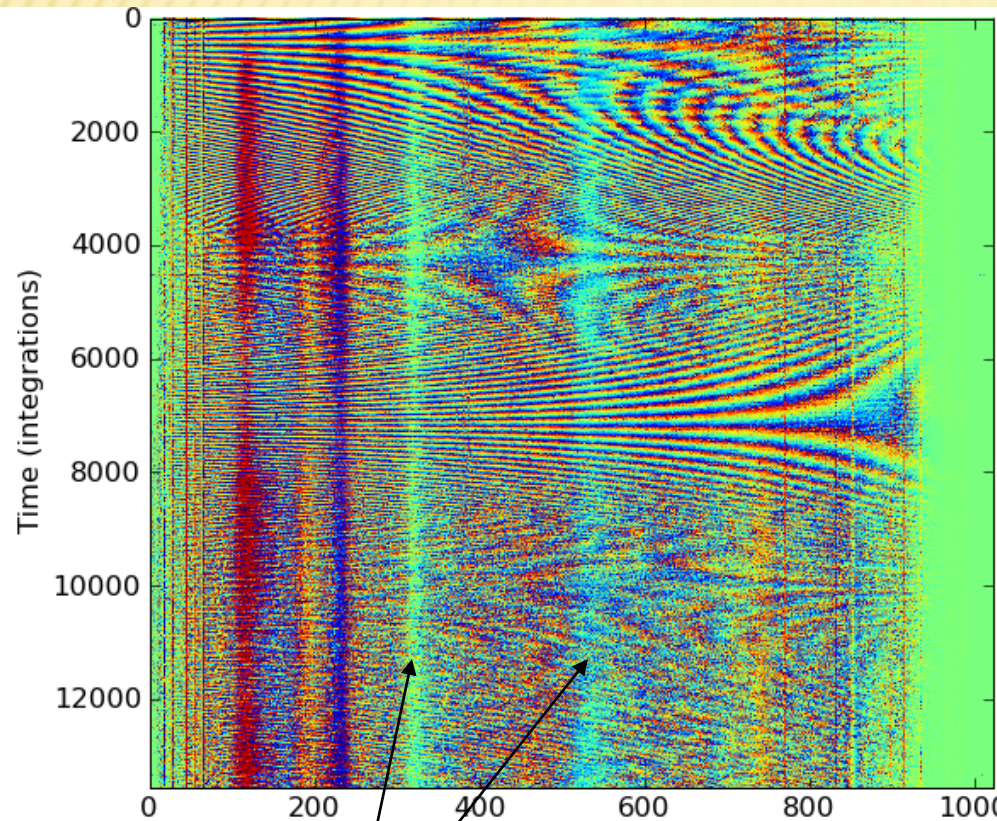
Intermittent TX
Beating sources

Satellite TX

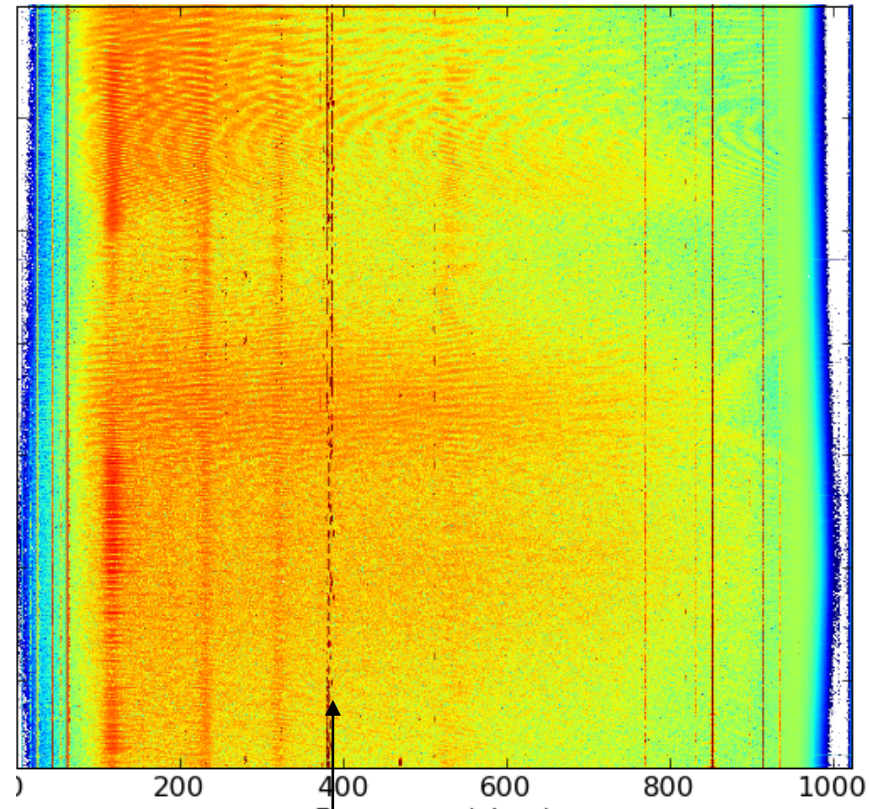
TV/Aircraft TX

PSA: 1 DAY, 1 BASELINE

Phase



Amplitude (log)



Crosstalk

Satellite TX

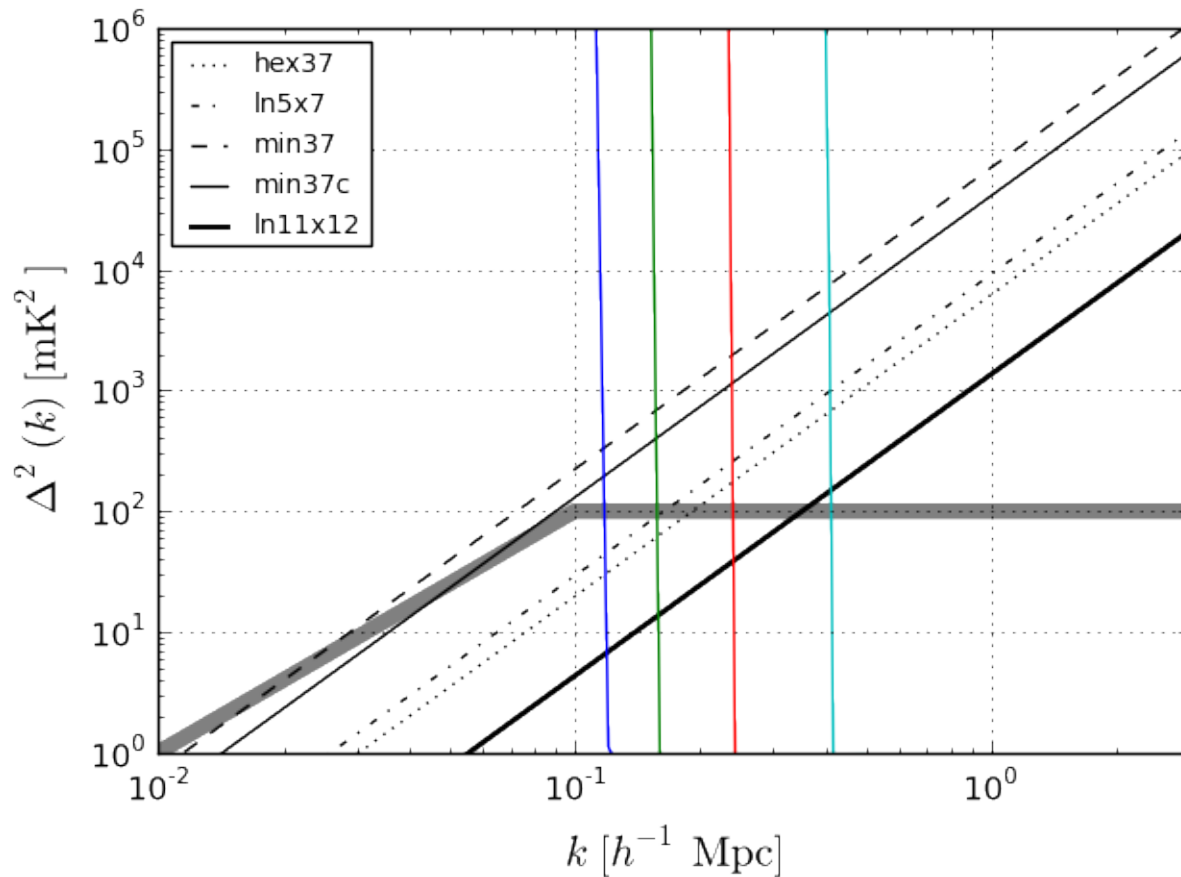
RECENT ACTIVITIES

Array Configuration Studies



Parsons et al. 2011a (in prep)

SENSITIVITY



- Maximally redundant configurations improve power spectrum sensitivity by more than one of magnitude

- Colored lines represent foreground contamination for different baseline lengths after delay transform technique (Parsons et al. 2011b, in prep)

CALIBRATION

138 MHz

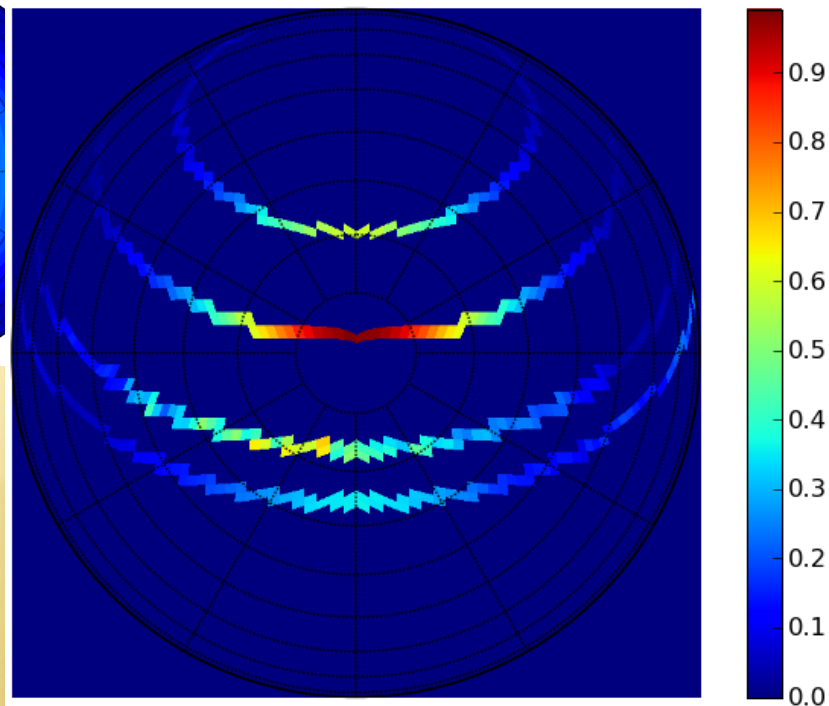
156 MHz

174 MHz

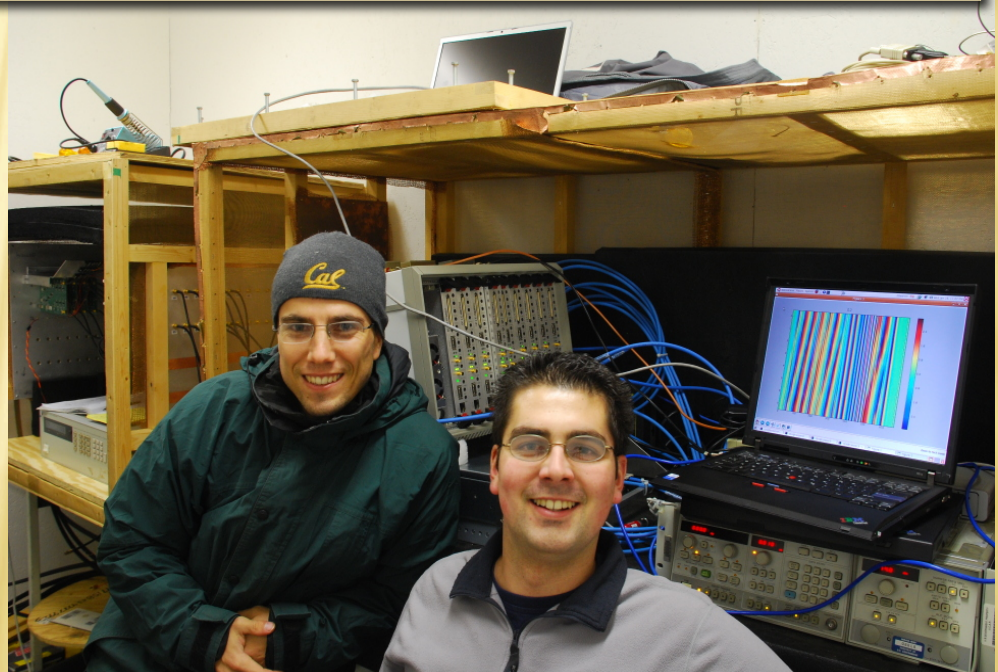
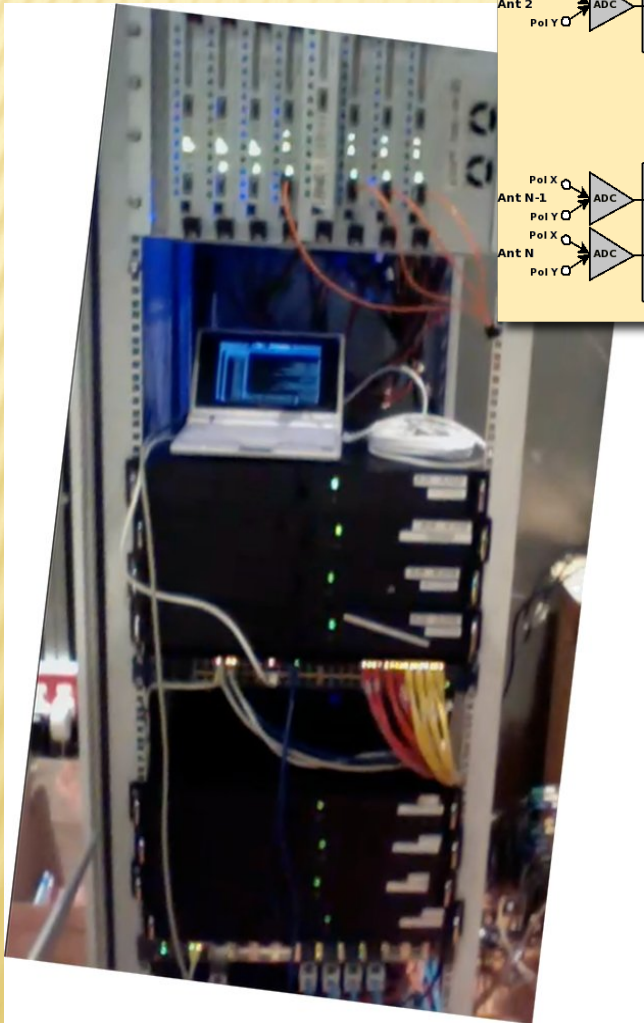
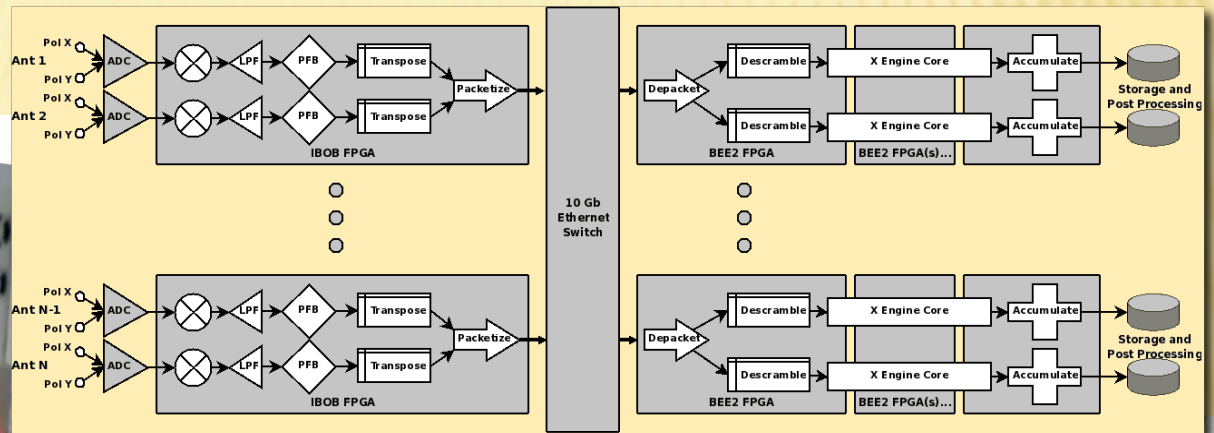
- Smoothness allows for easier calibration
- Lack of structure on the sky facilitates delay transform approach

$$a_\nu(\hat{s}) = \sum_{k=0}^7 \nu^k \left[\sum_{\ell=0}^8 \sum_{m=0}^{\ell} a_{\ell m}(k) Y_{\ell m}(\hat{s}) \right]$$

40dB zenith to horizon, 60 degree FWHM
Smooth spatially and vs. frequency

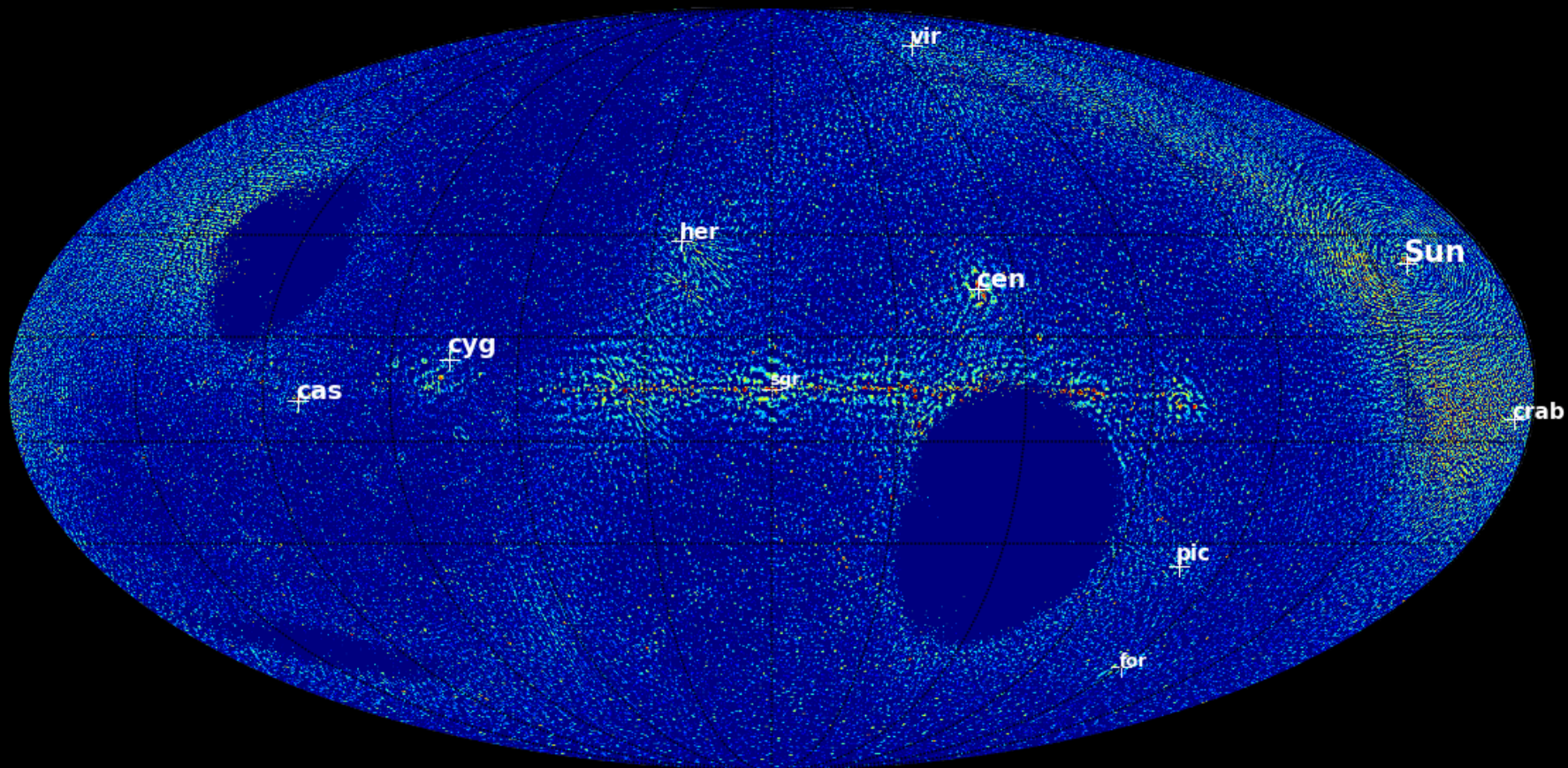


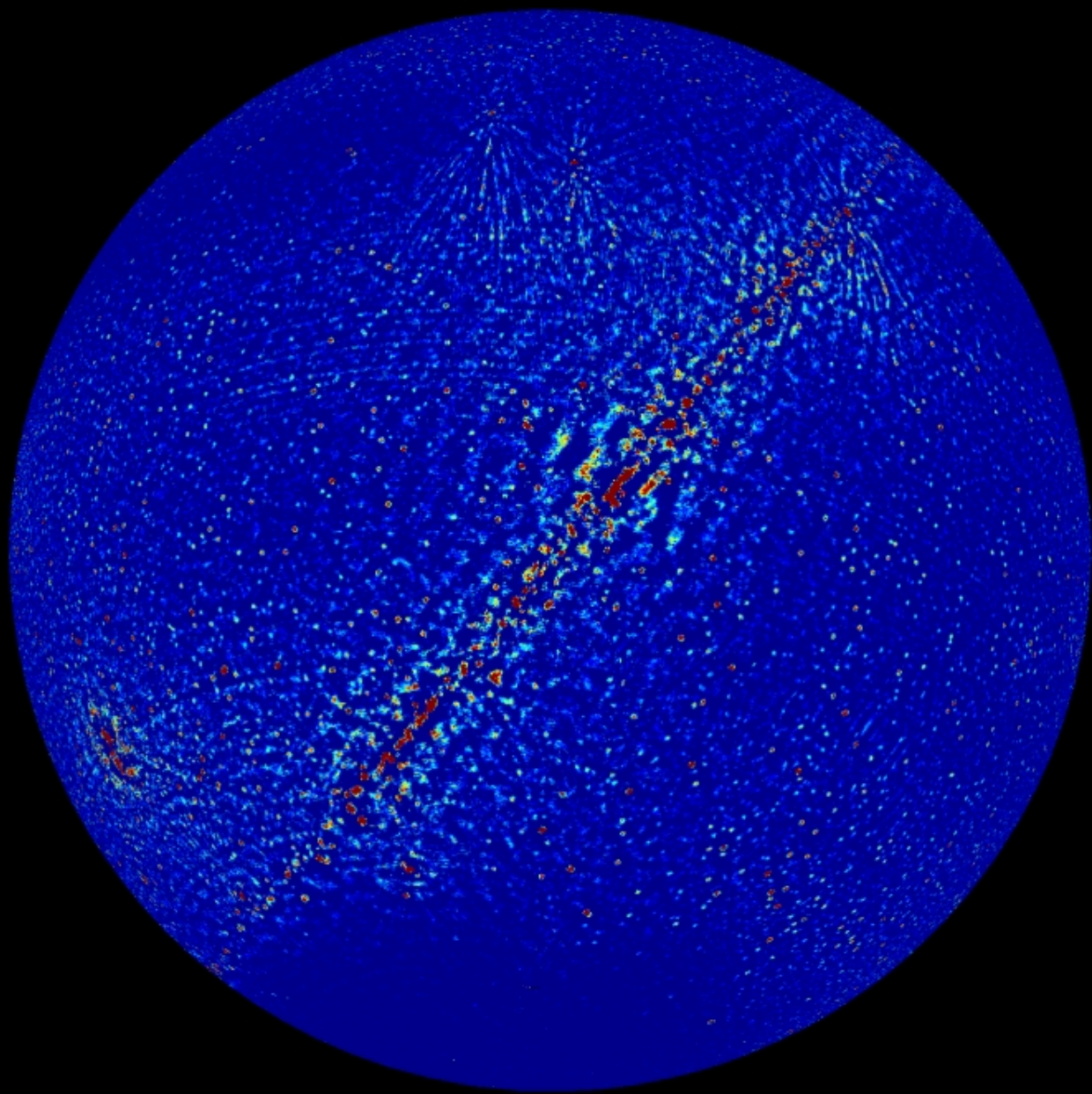
CASPER CORRELATOR ARCHITECTURE

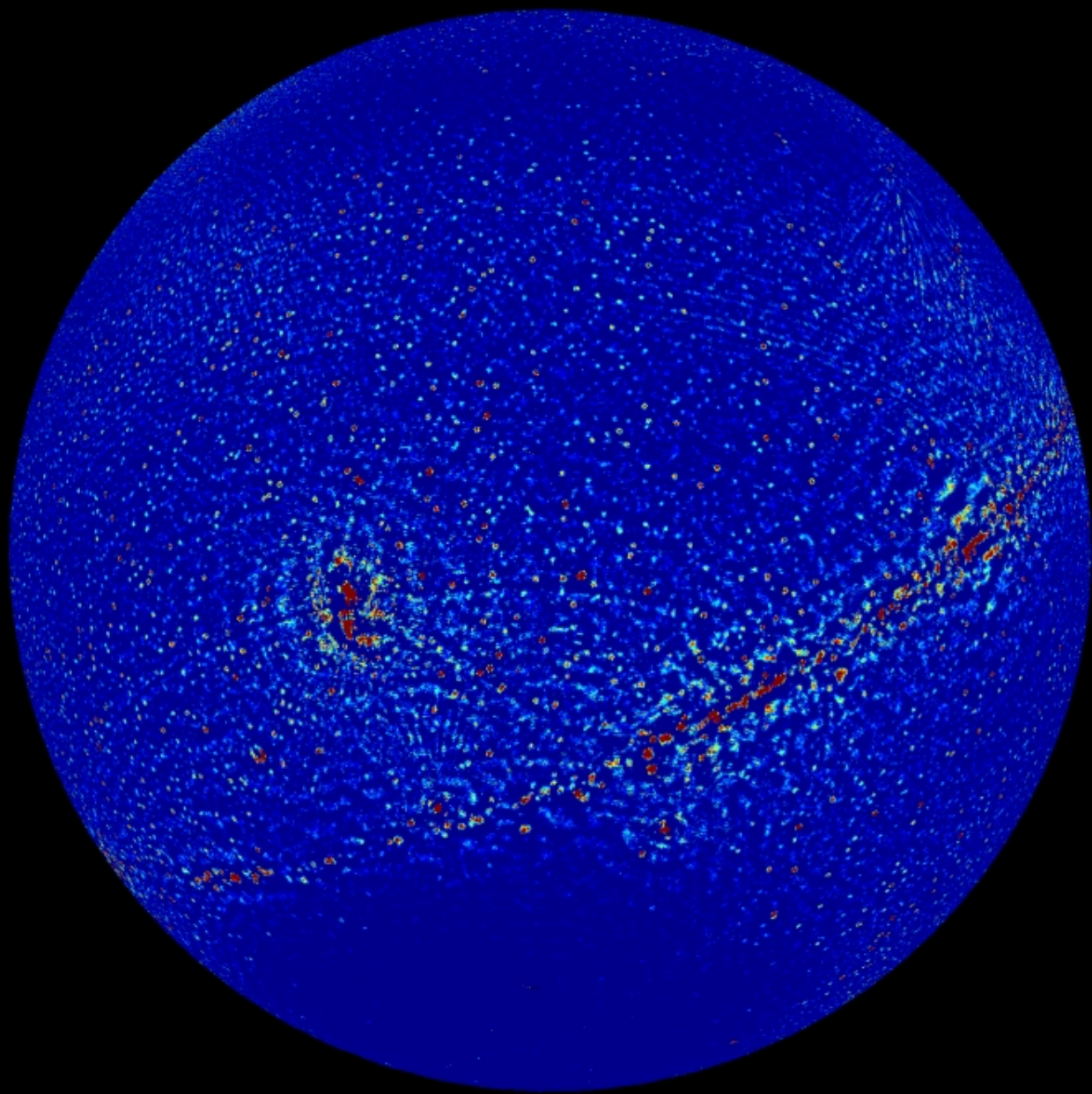


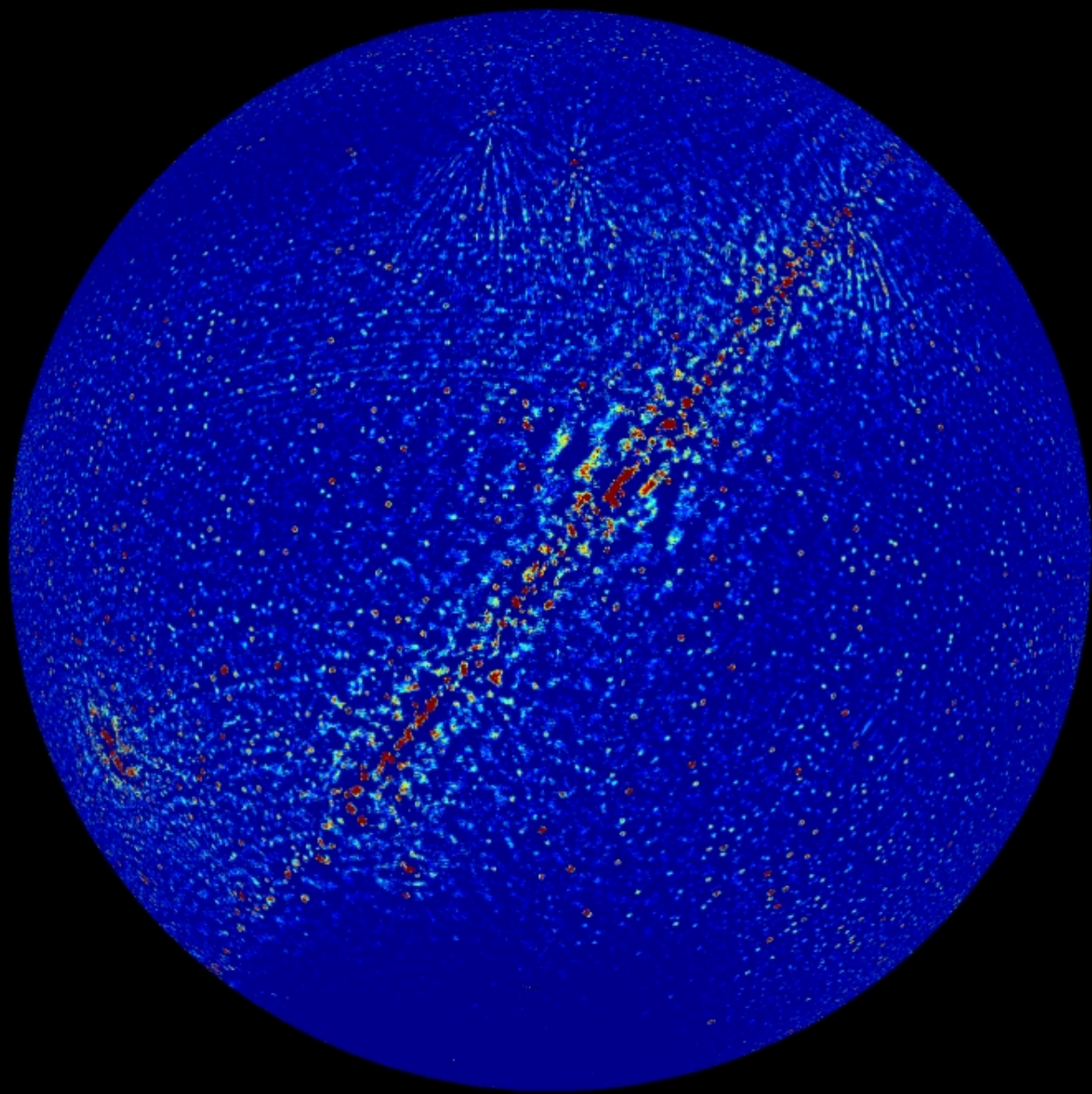
PAPER AND HERA

- ✖ Reconfigurable arrays explore tension between min/max redundancy for imaging/power spectrum
- ✖ Delay spectrum approach very useable and holds significant promise for foreground removal
- ✖ Single dipoles with smooth beams present interesting contrast to tile designs
- ✖ Scalable correlator architecture on track for HERA 2020





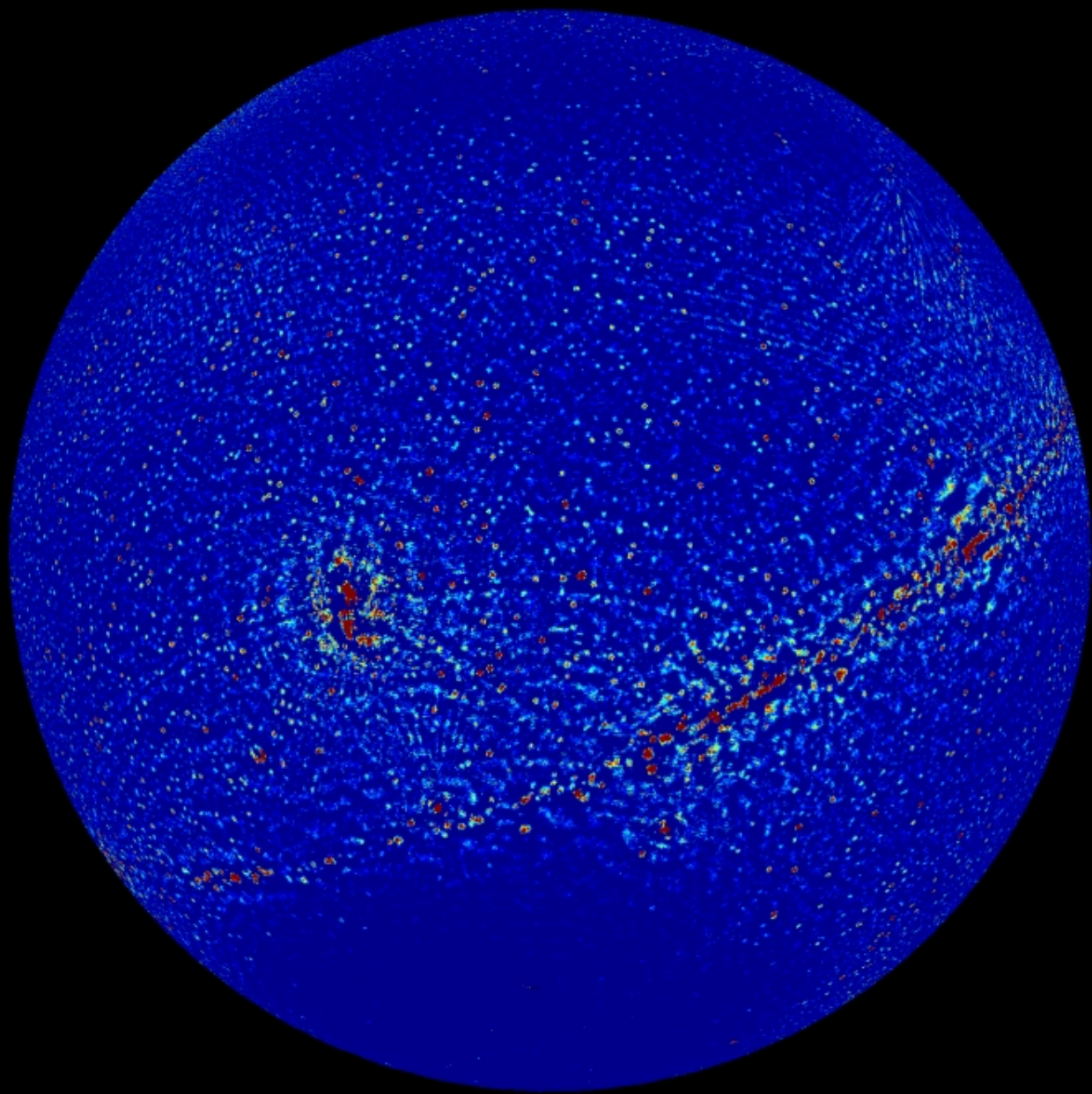


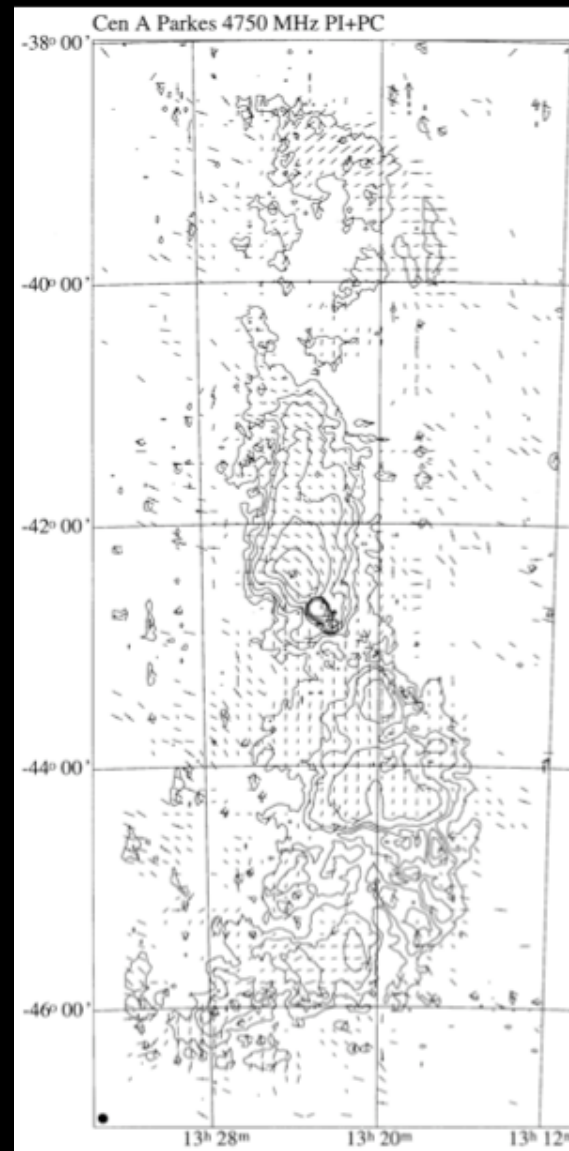
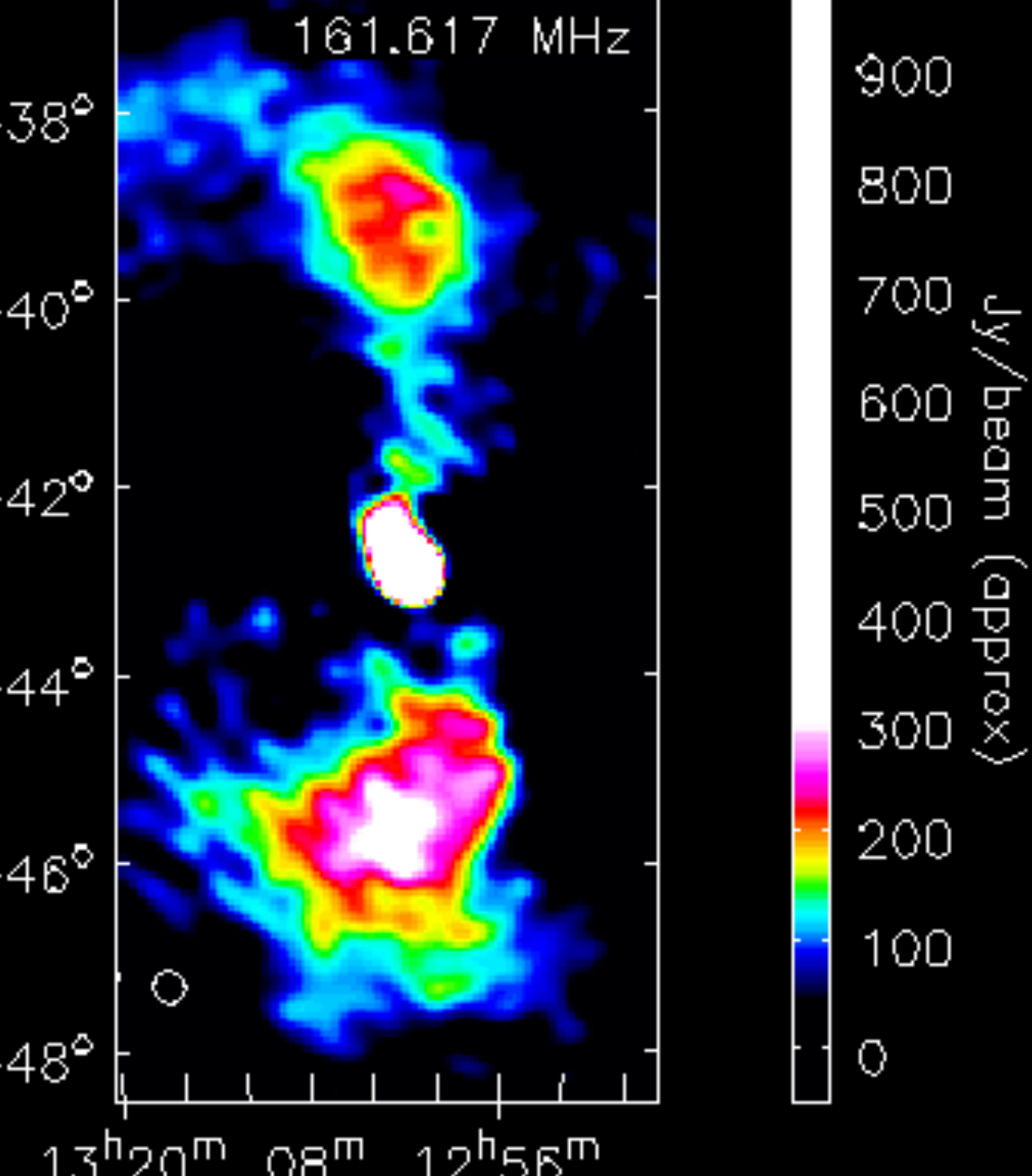


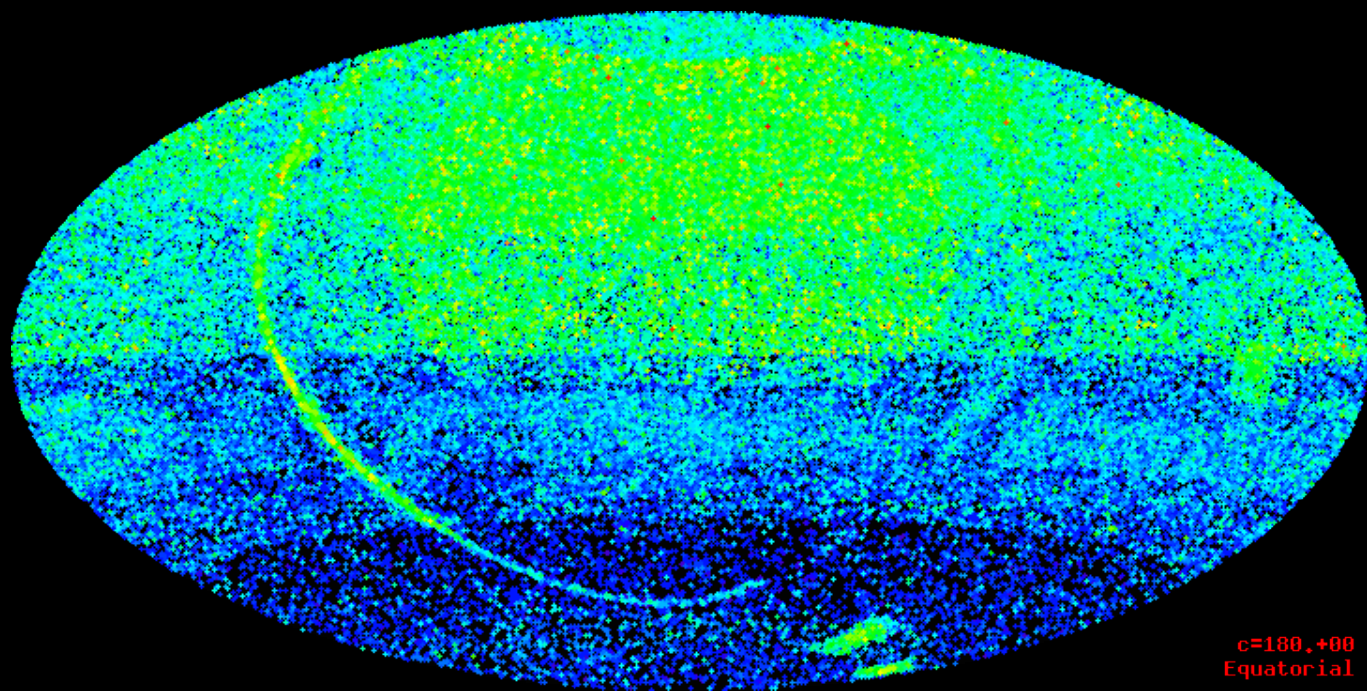
PAPER Galactic Center

SgrA*

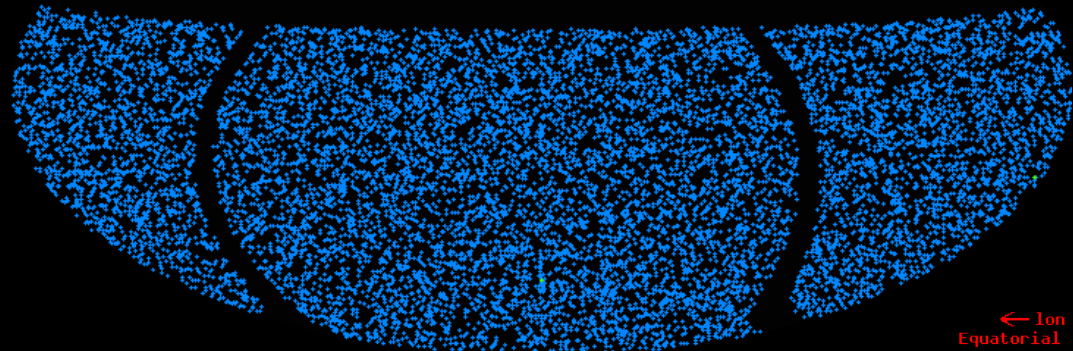
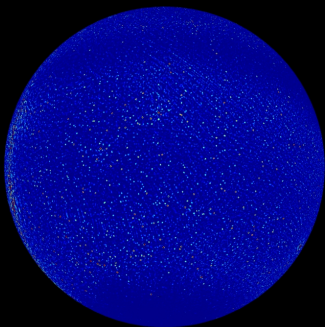
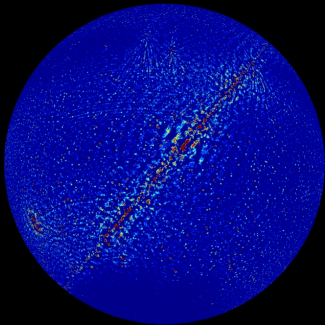
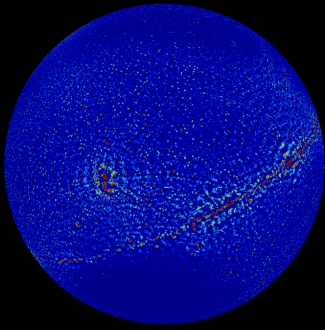








Towards a Southern Catalog

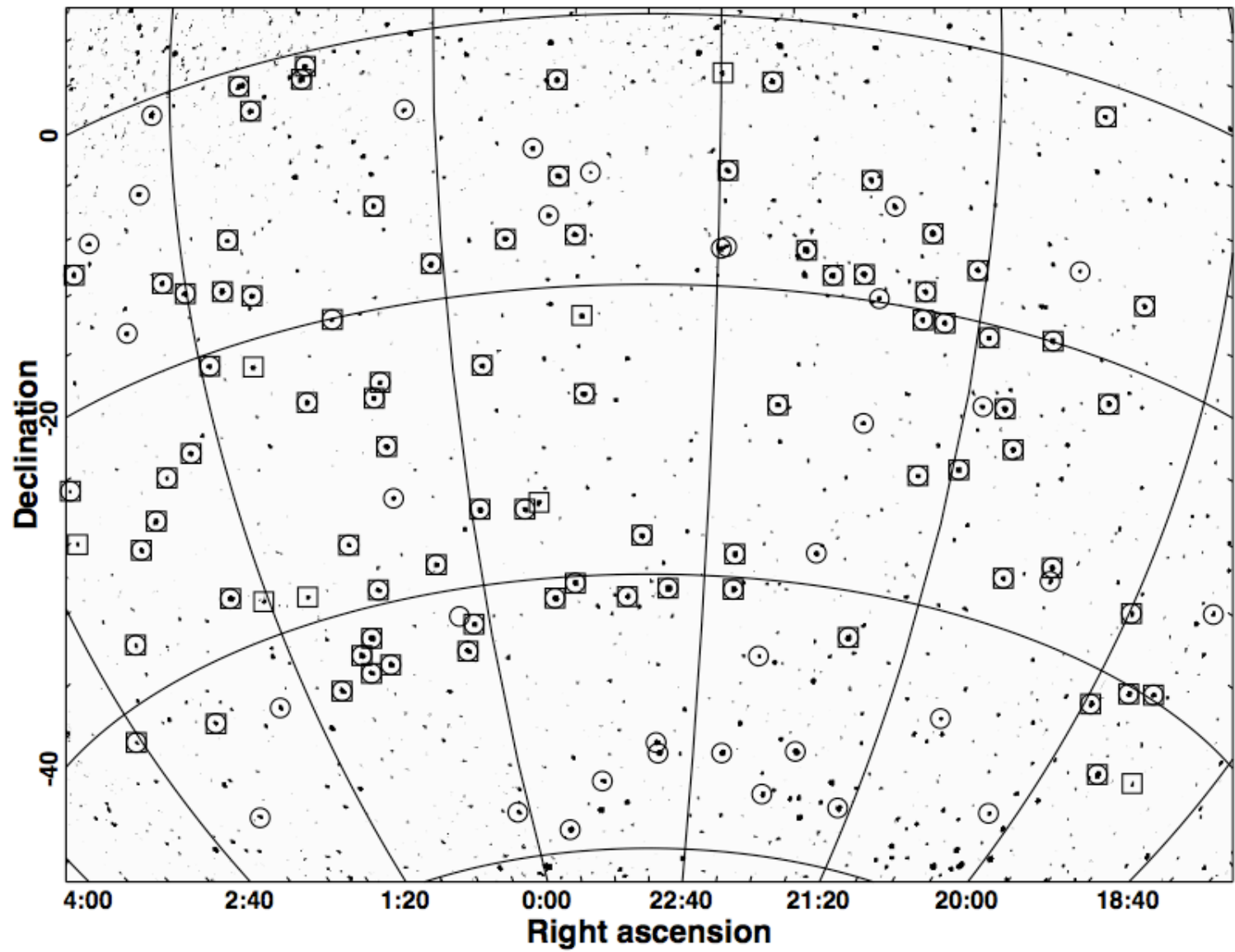


Dirtyish PAPER all sky map

+

MRC (408MHz) as targets (Burgess 2008)

499 sources below 10 Dec with flux $>4\text{Jy}$



- ✗ Compare with Culgoora at 160MHz and MS4 (est) at 178MHz

