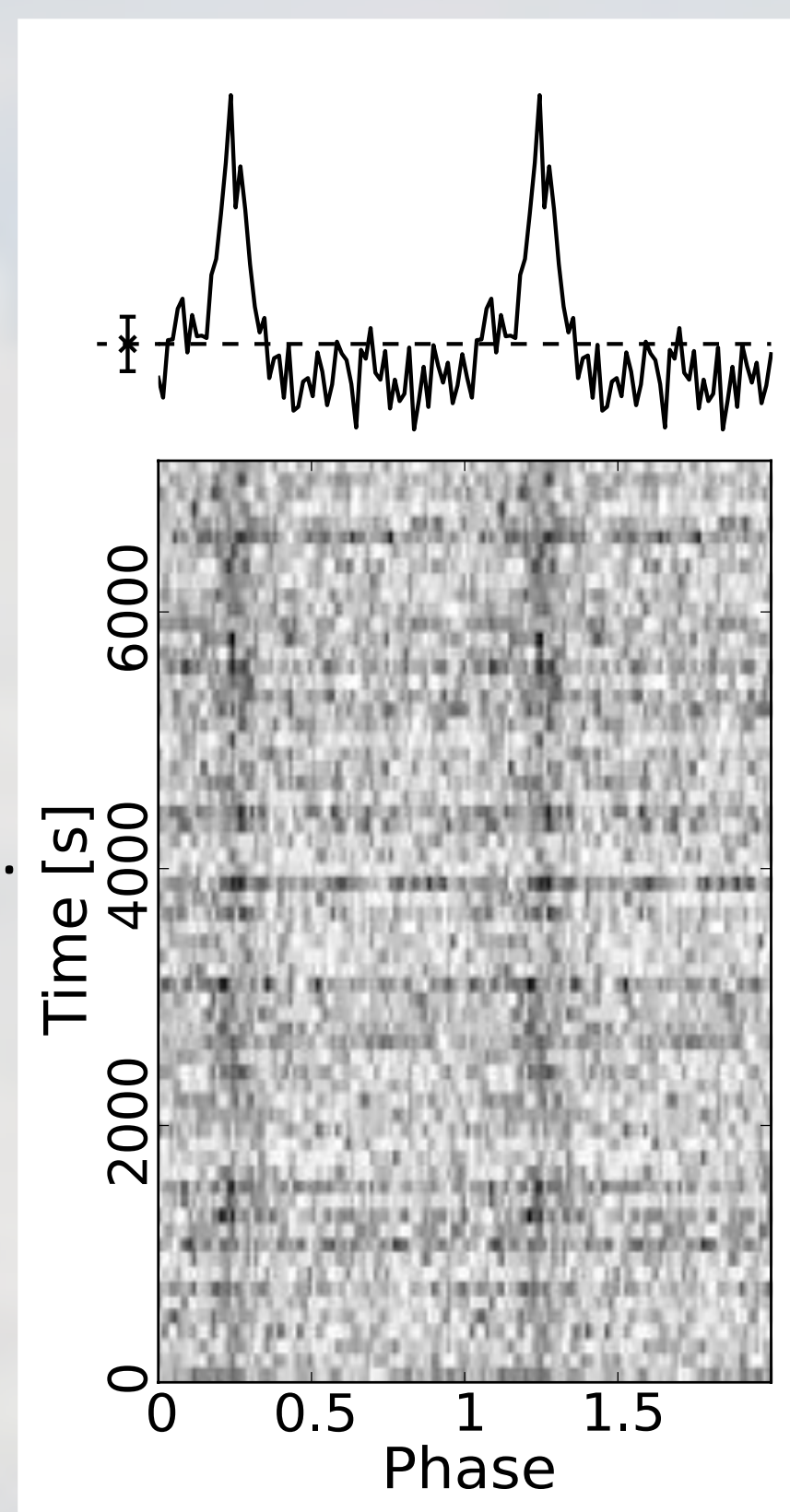
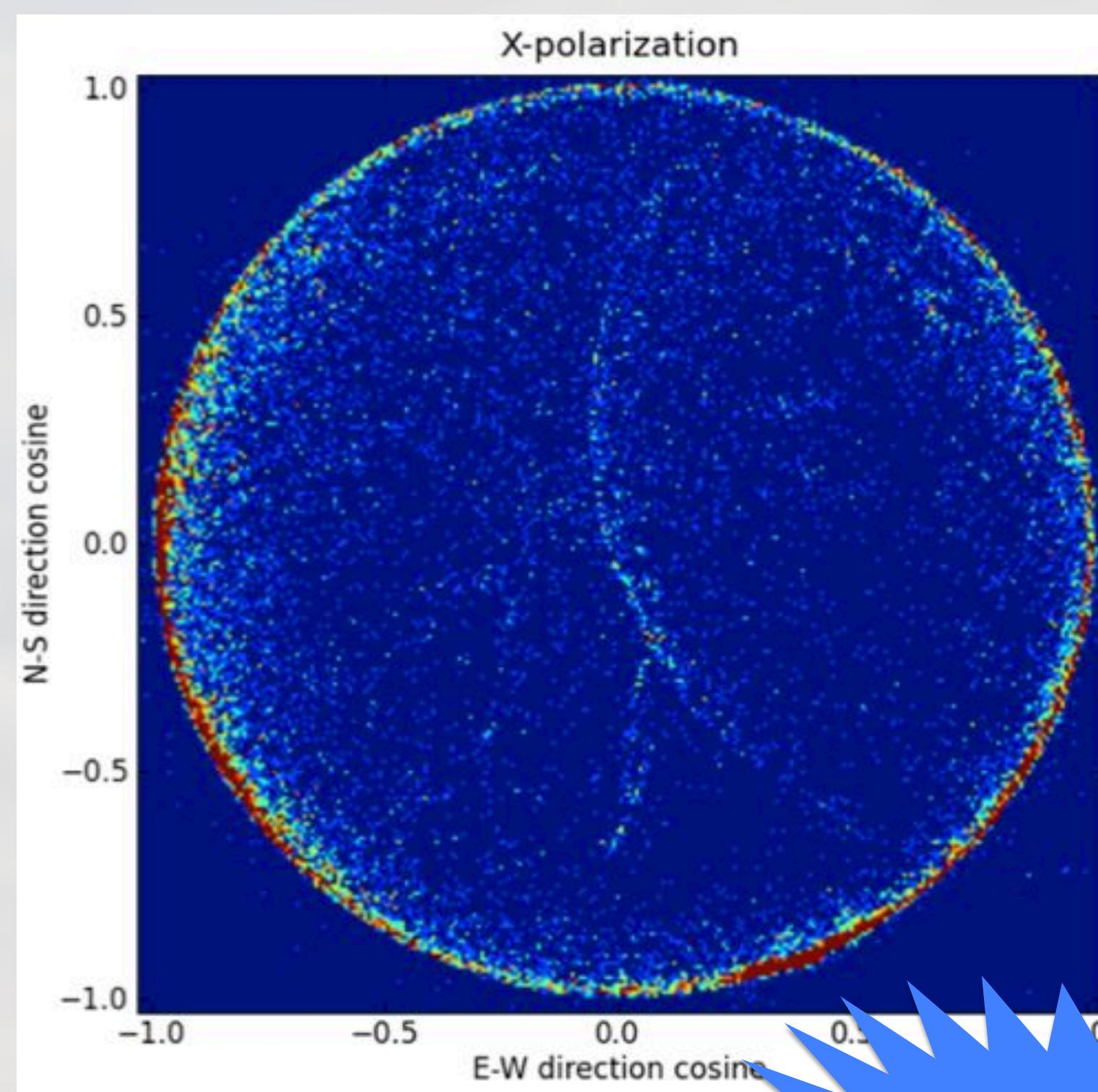


LWA1 Science

- LWA1 is a radio telescope operating between 10 and 88 MHz in New Mexico, USA. The 520 dipoles provide excellent sensitivity
- LWA1 supports a variety of science cases from the ionosphere to the dark ages
- Recent results include studies of the neutral wind in the ionosphere via meteor trails and detection of the millisecond pulsar J2145-0750



J2145-0750
(Dowell et al. 2013, ApJL)

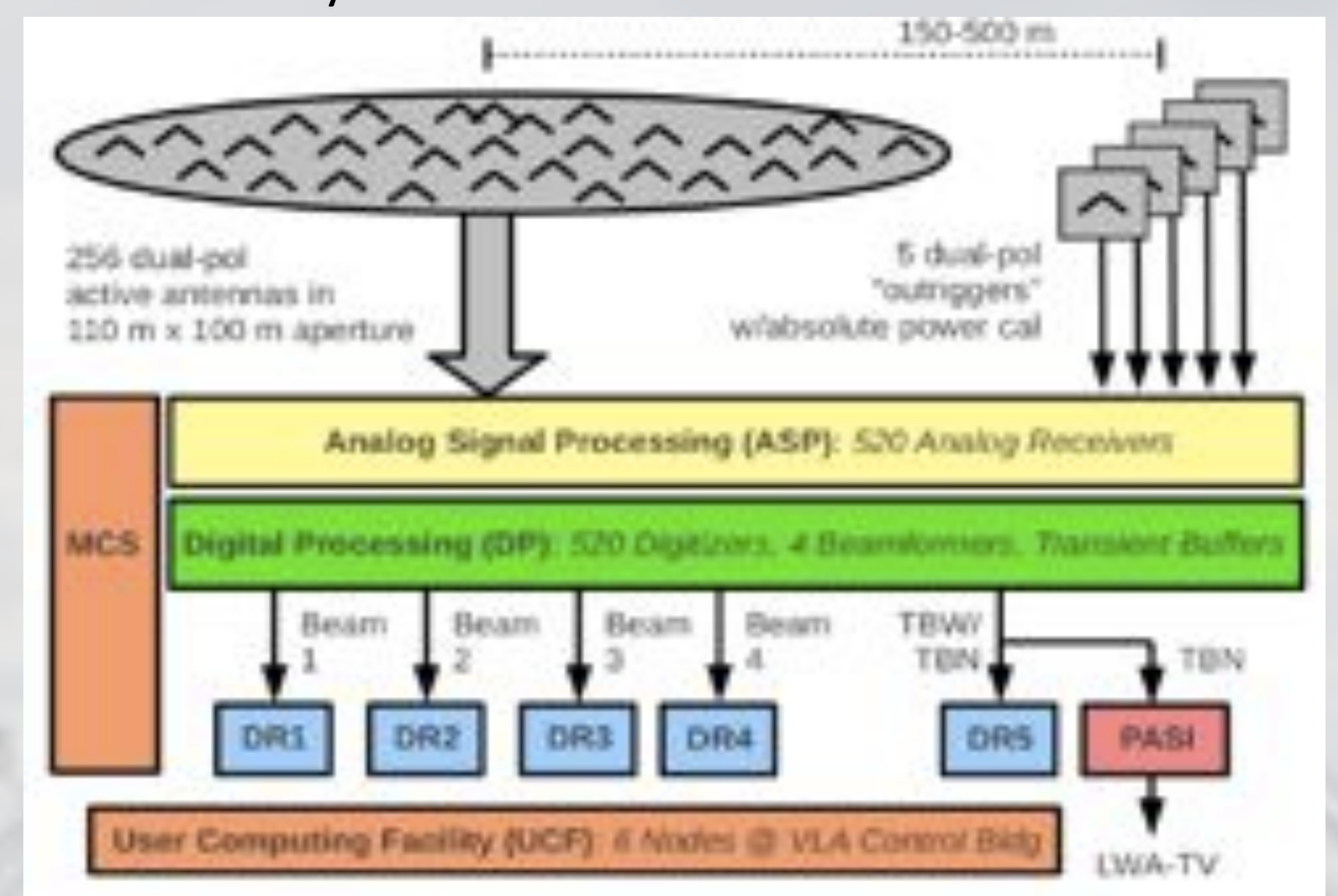


Meteor Trails
(Helmboldt, in prep.)

Proposals
Due Nov. 1

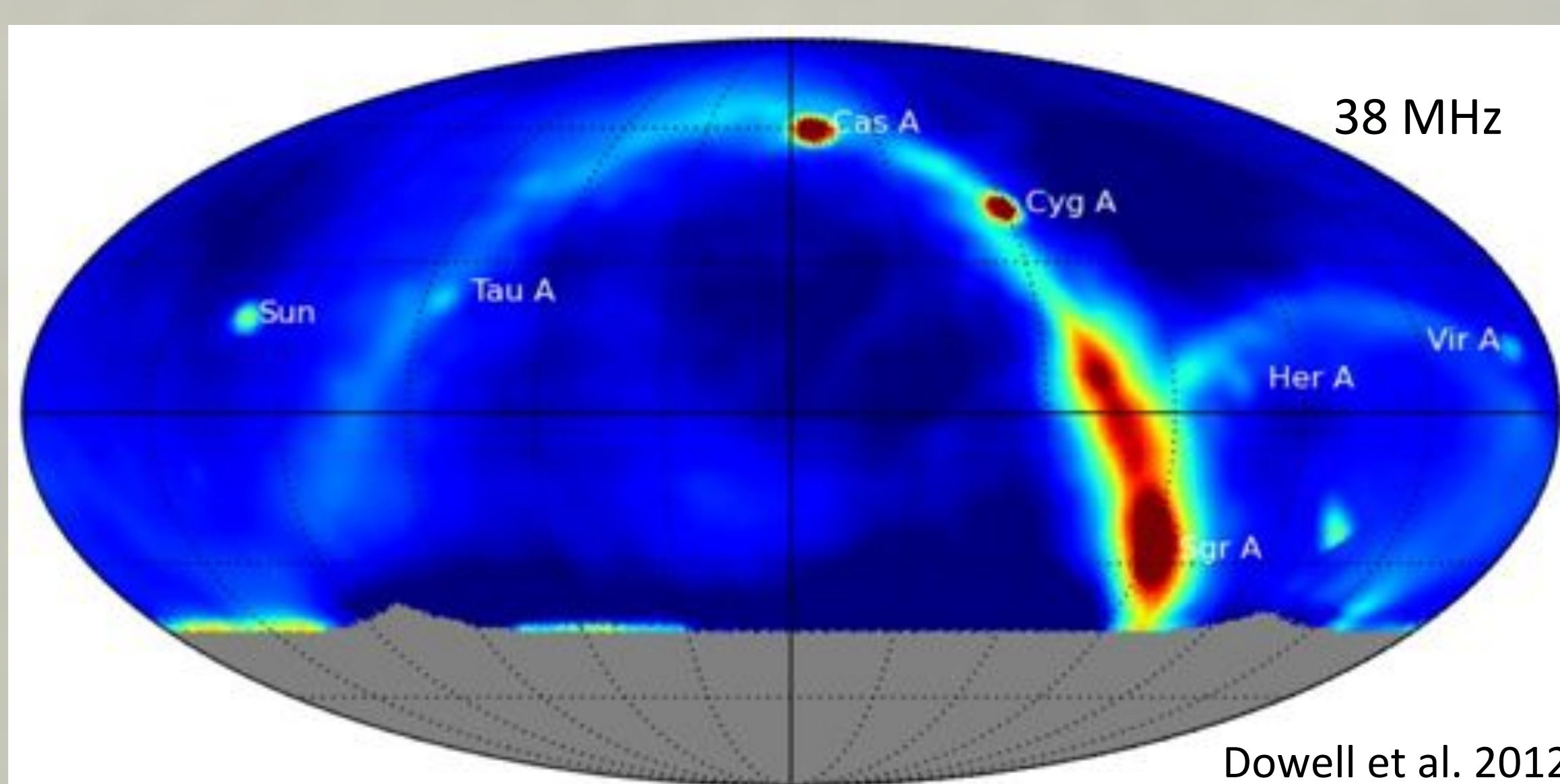
LWA1 Architecture

- LWA1 provides 4 independent beams, each 16 MHz wide or a signal from all dipoles (100 KHz continuous or 98 MHz but only for 61 msec every 5 min)
- The LWA Software Library (LSL) provides analysis tools for working with LWA1 data
- The LWA Users Computing Facility with 50 TB of disk provides computing co-located with the data collection for fast analysis

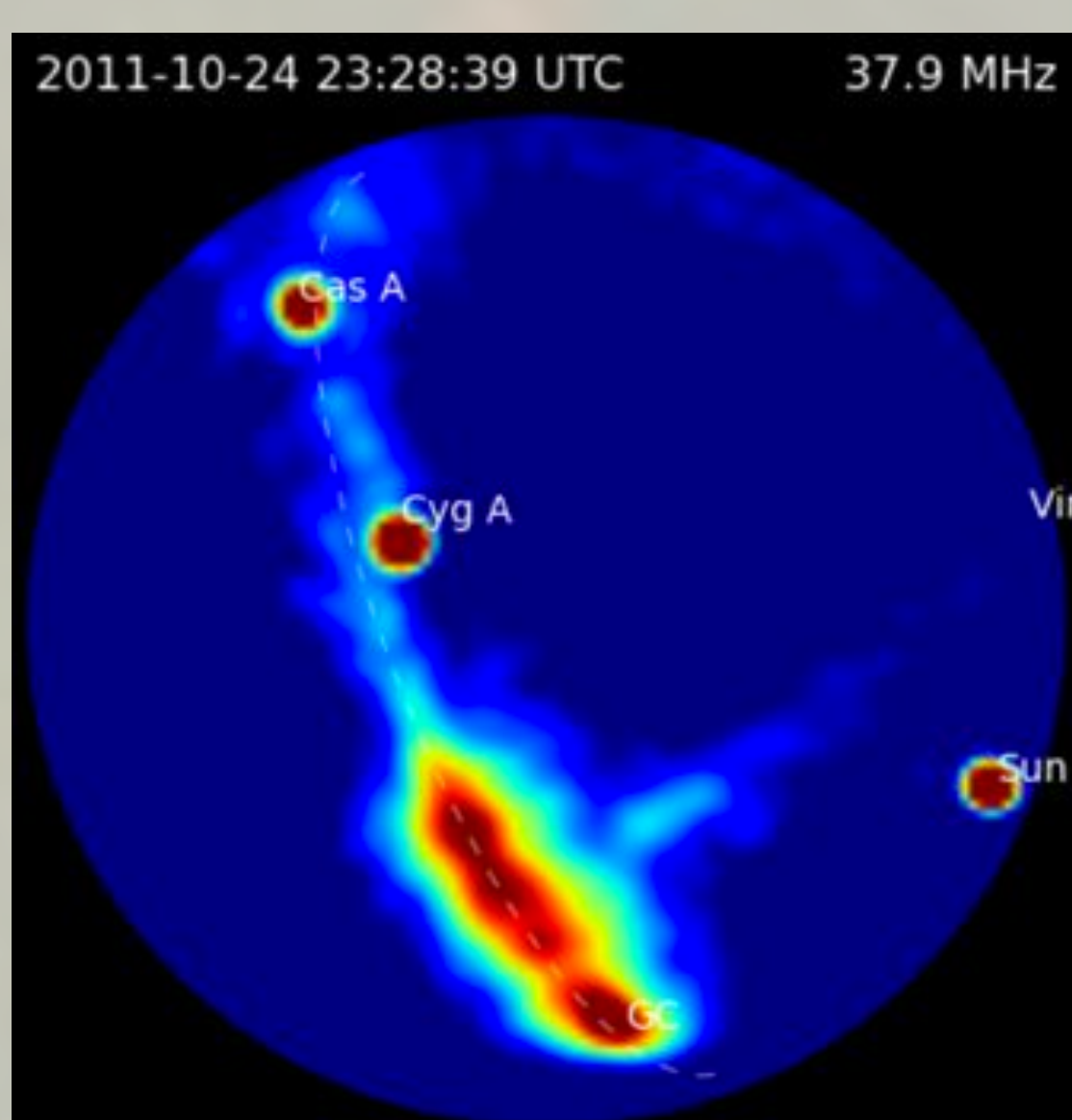


Co-location of processing with data leads to faster data analysis

All-sky Monitoring



Dowell et al. 2012



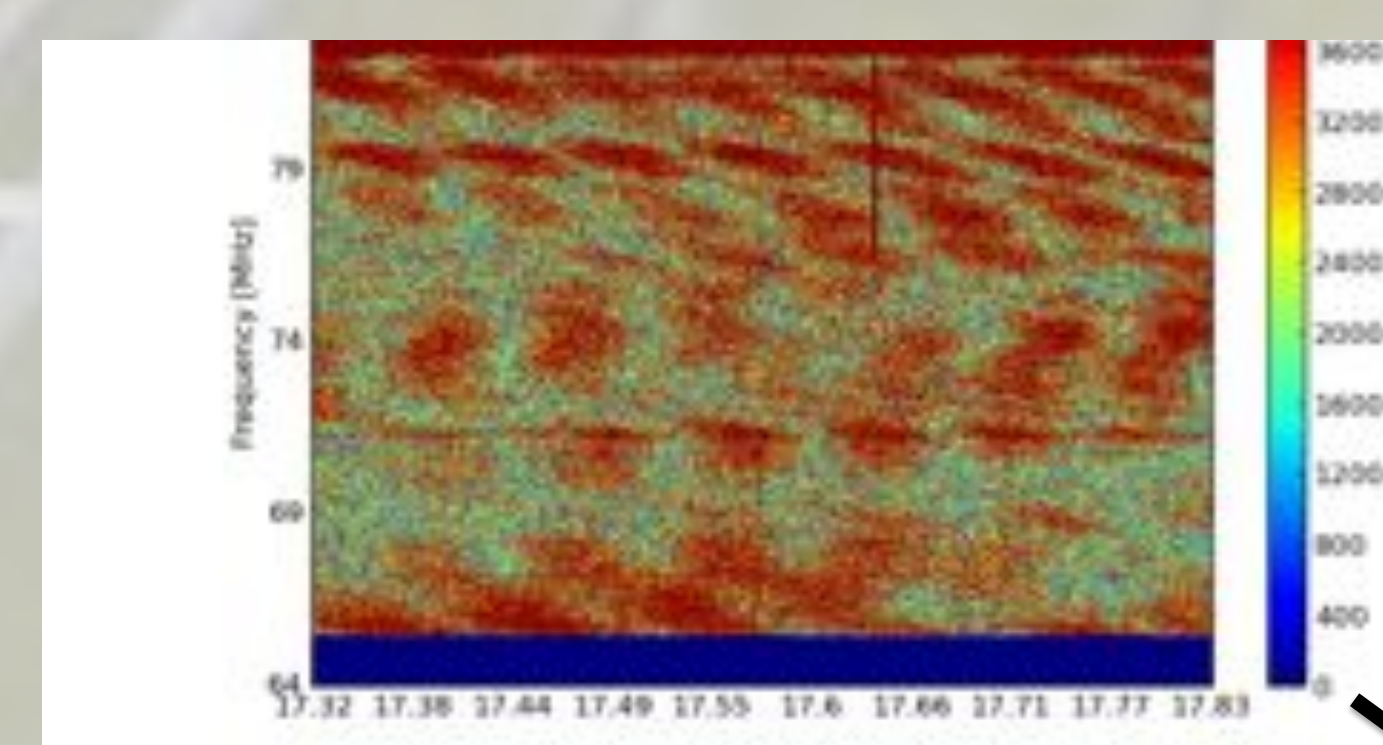
Software correlator and imager
Receives a 100 KHz stream from all 520 dipoles
Near-real-time imaging at 1 sec cadence
100% duty cycle covering 3π steradians

Hartman et al. 2013, in prep.



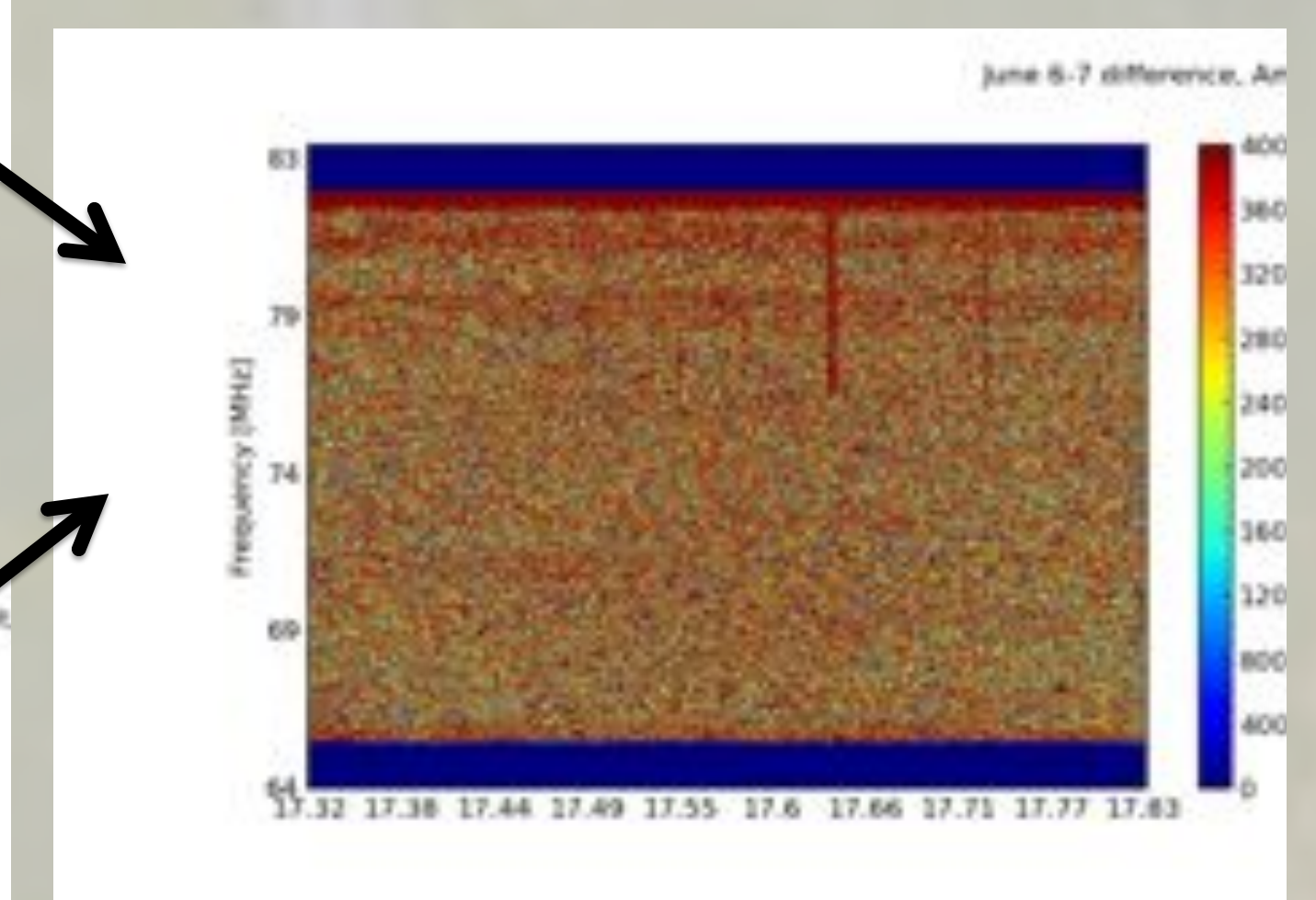
LWA1

Galactic Center Campaign

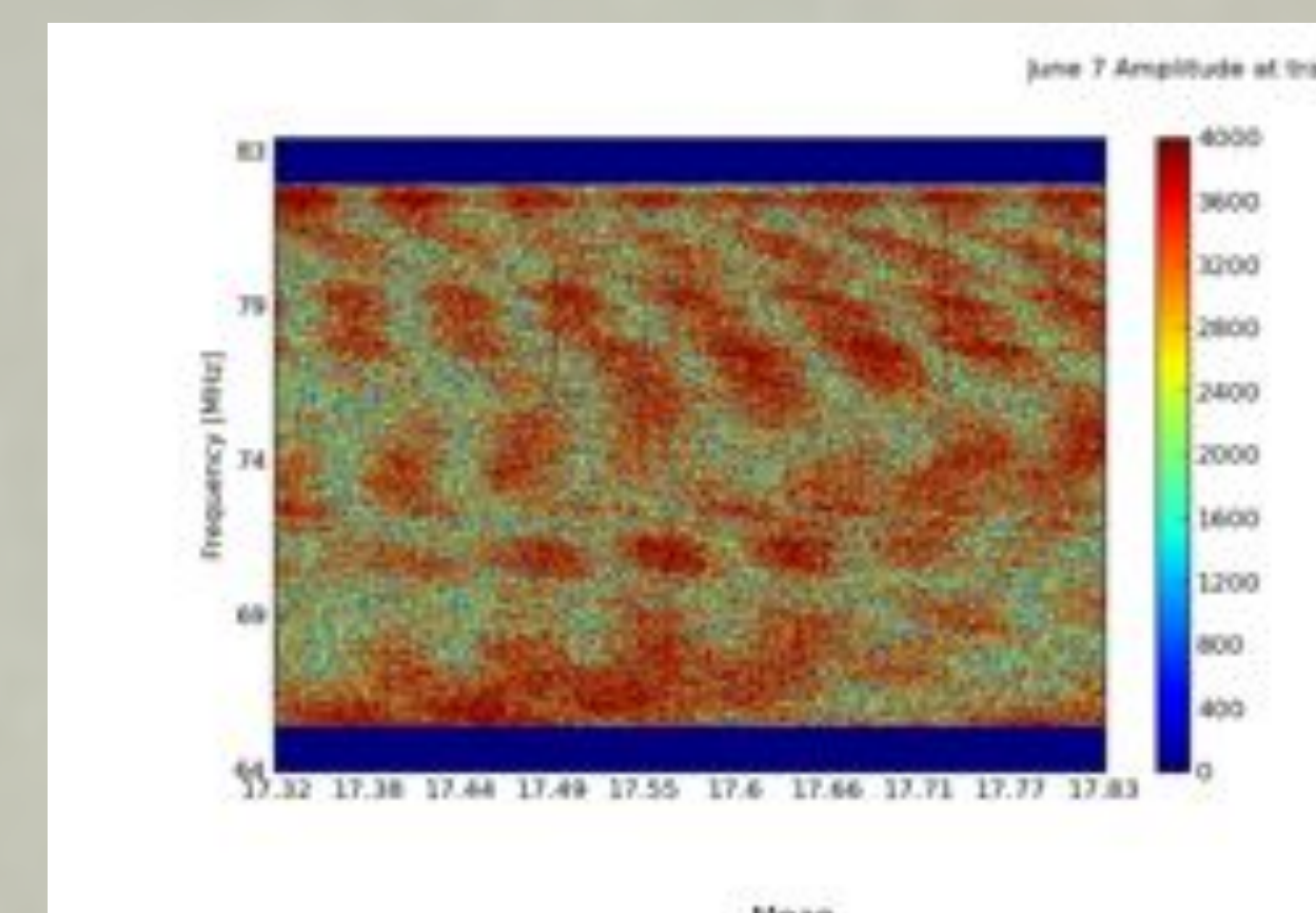


June 6, 19 MHz BW, 30 minute scan

Multiple beams, wide bandwidth
Nightly observations from May 1 – June 8
~4 hours each night covering galactic center transit



Difference of June 6 and 7 scans
Resolution: 4 seconds, 4.7 KHz pixels



June 7, 19 MHz BW, 30 minute scan

Cutchin, Hyman, Kassim et al. 2013, in prep

Can realize ~50X and 15X improvements in sensitivity by averaging in BW and time, respectively: **approach 1 Jy rms!**