The Expanded Long Wavelength Array (eLWA)

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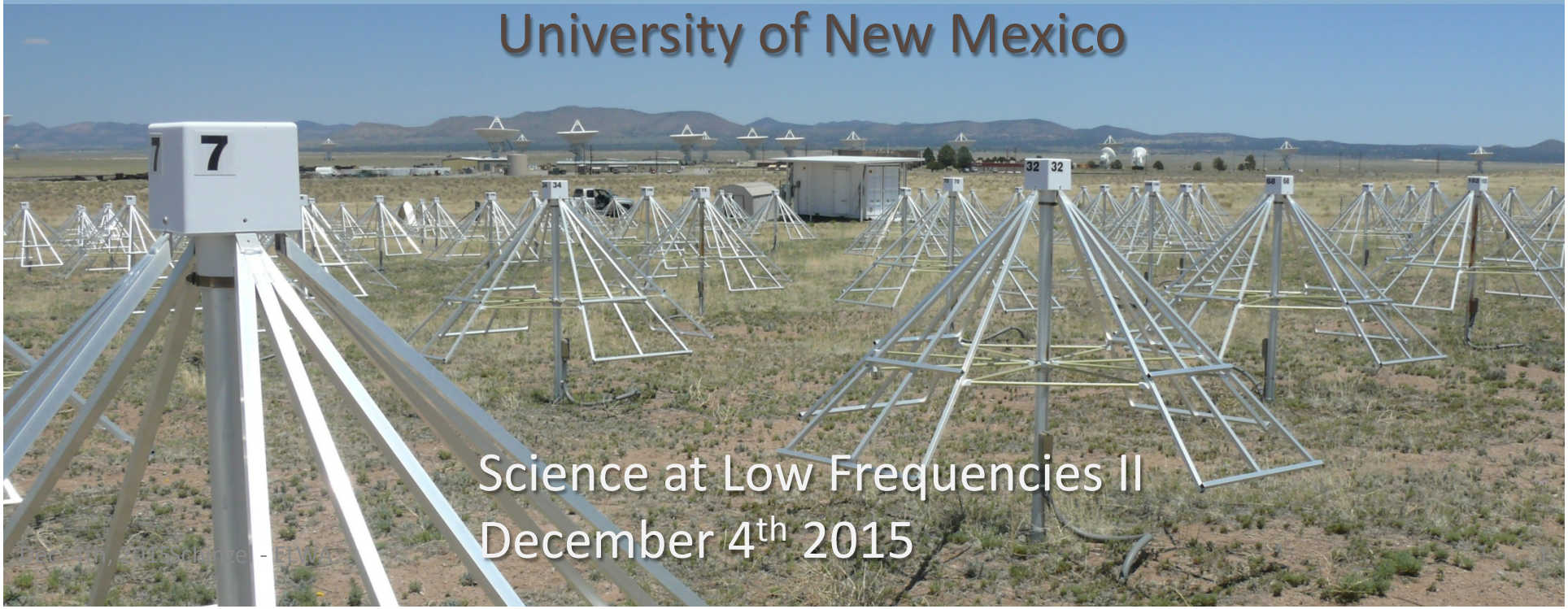


Science at Low Frequencies II
December 4th 2015

VLA 4-band MJPs

Talk by Frazer Owen Monday

- Adds 50-80 MHz capability to the VLA
- More sensitive (wider band) than old 4-band system
- Resolution ~ 20” in A config

Dan Mertely (12/01)

ea06 ea09* ea10
ea12 ea13* ea14
ea18 ea19 ea23*
ea27*

* = Recent install
+ 4 more soon

LWA1 / LWA-Sevilleta

Talk by Jayce Dowell Monday

eLWA Demonstration

Date	Target	Array	Bwidth
2015-08-20	Tau A	4VLA+LWA1+Dipole	16 MHz
2015-09-17	3C196/3C286	6VLA+LWA1	8 MHz
2015-09-24	3C196	6VLA+LWA1	8 MHz
2015-10-08	3C295	6VLA+LWA1	8 MHz

2015-08-20: Fringes between single LWA dipole and VLA antenna

2015-09-24: Fringes at low elevations: 20.5 – 18.0 deg.

2015-10-08: Power outage between 09/24 and 10/08. No fringes b/w VLA and VLBA. Found fringes with LWA with 3 ms delay.

eLWA Demonstration

9/17/2015: 3C196

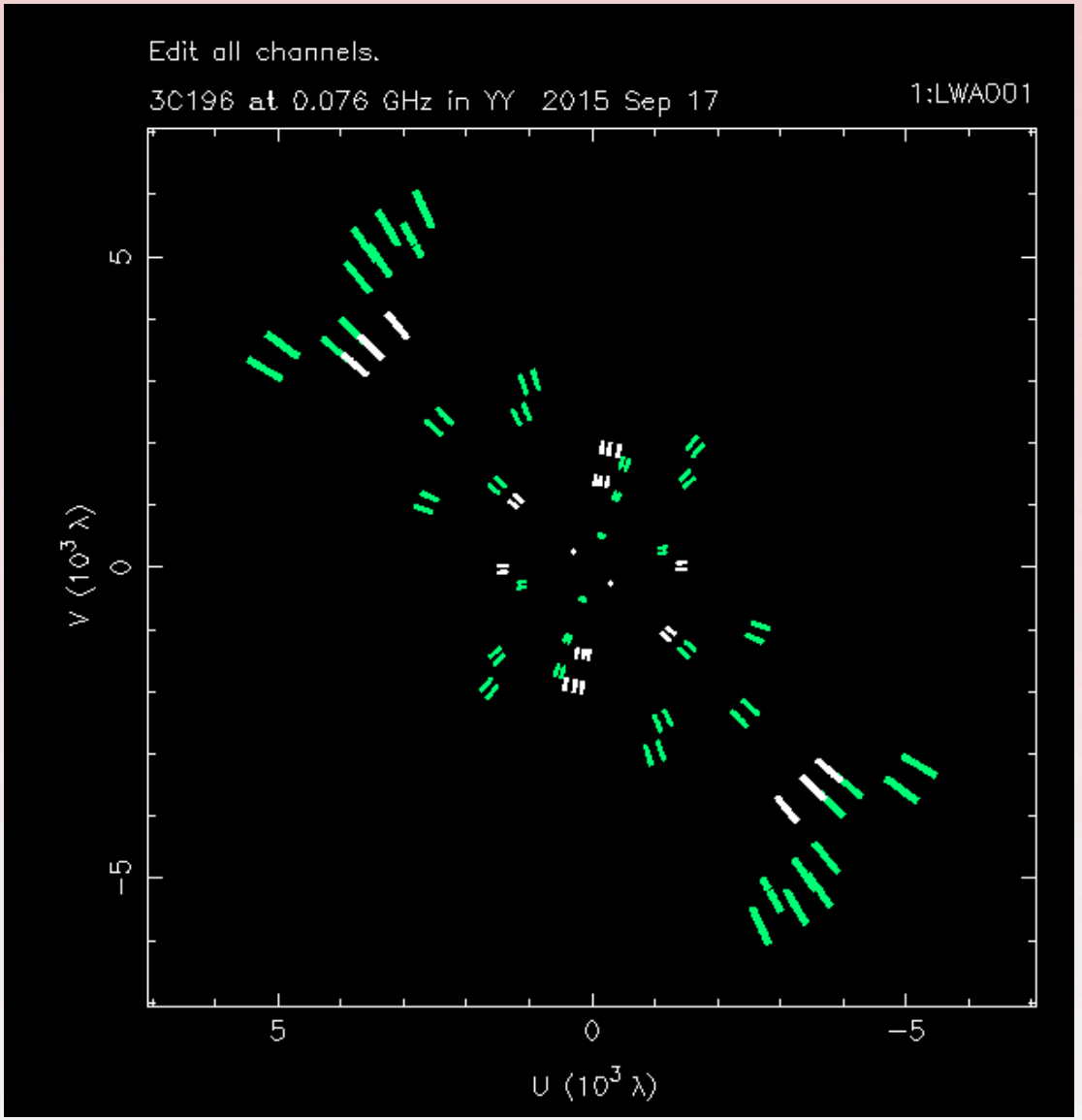
6 VLA + LWA1

35 minutes

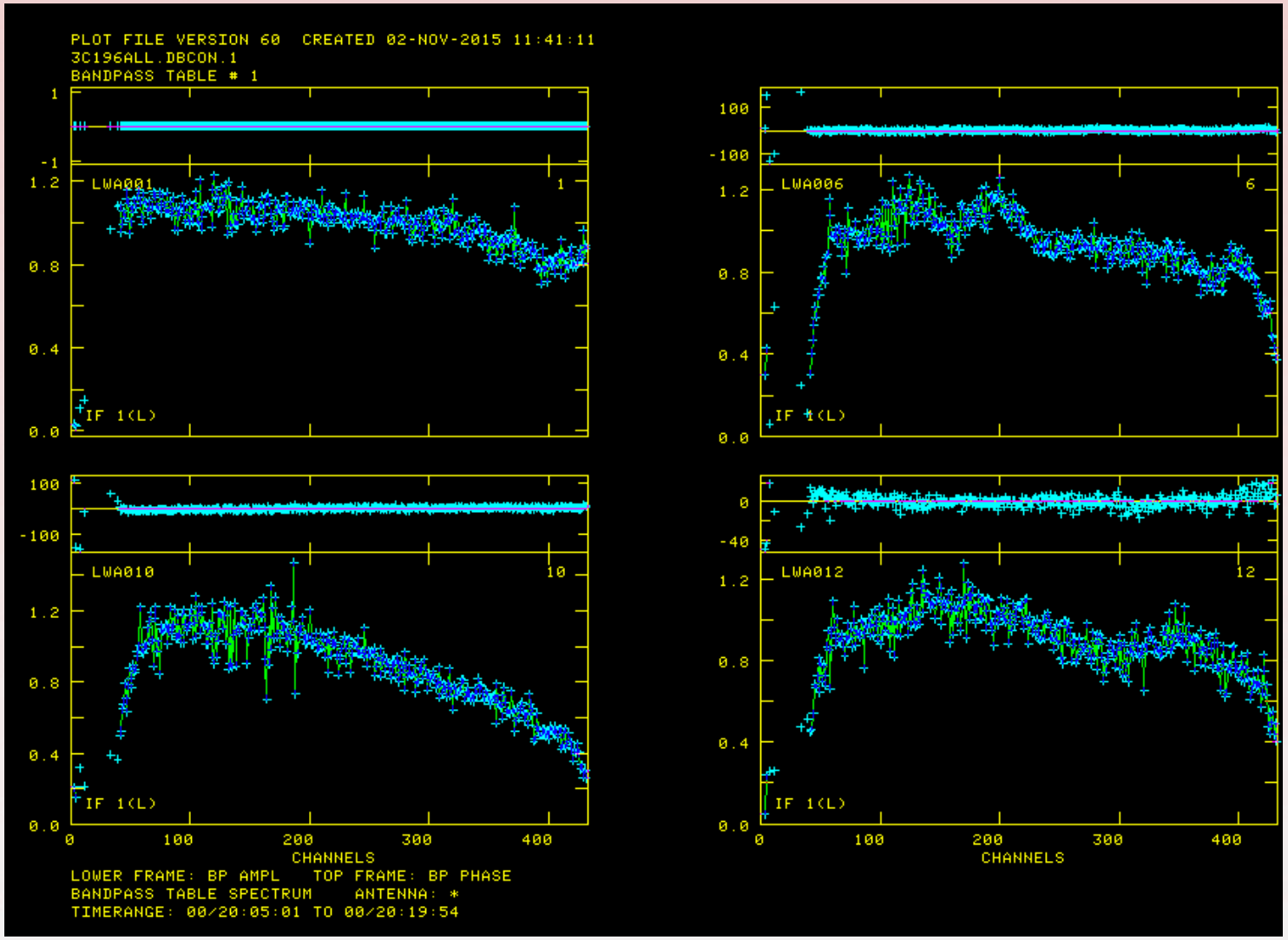
A config

72 – 80 MHz

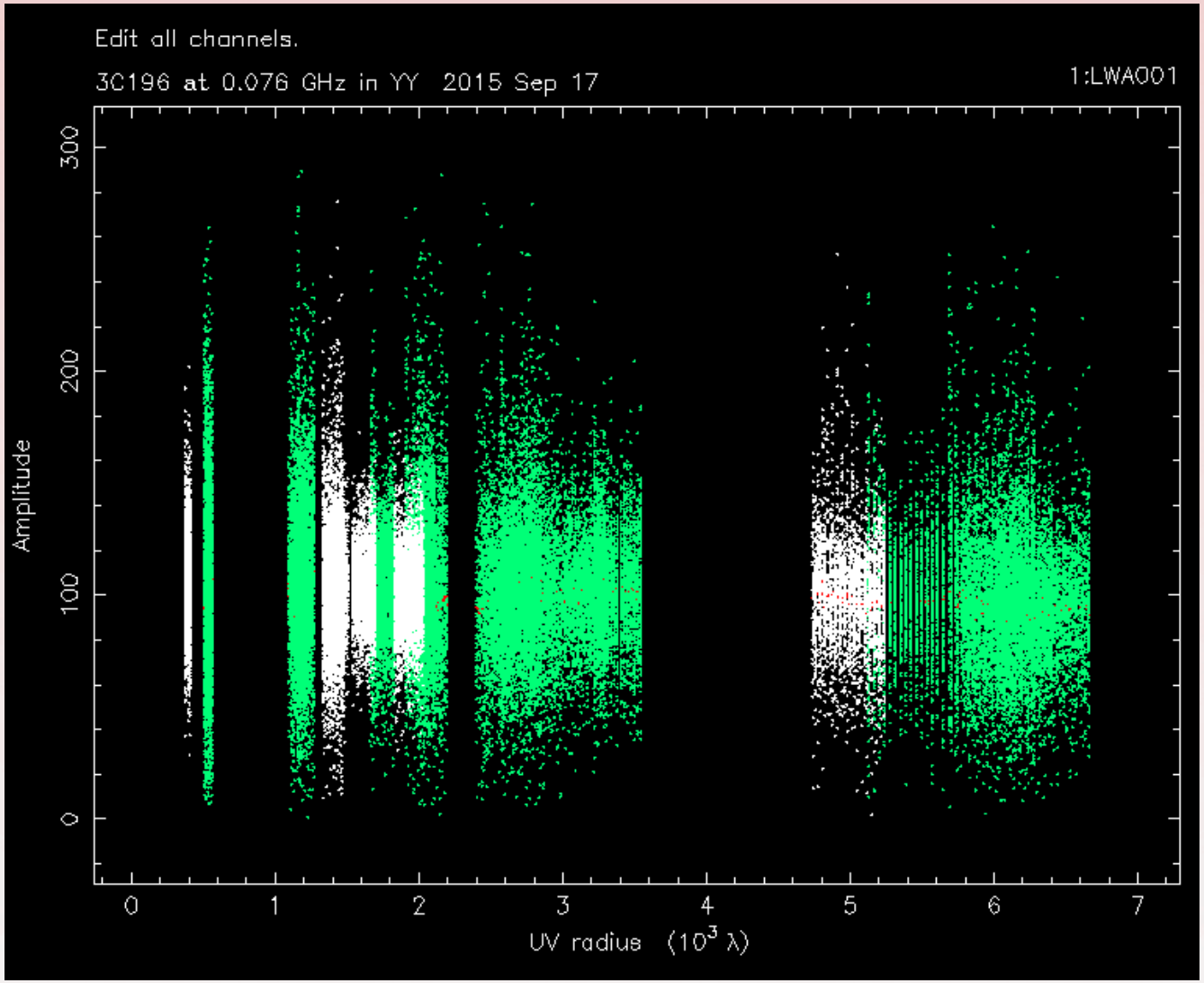
Correlated using the LWA Software Library



eLWA Bandpass



eLWA Visibility Amplitudes



eLWA Demonstration

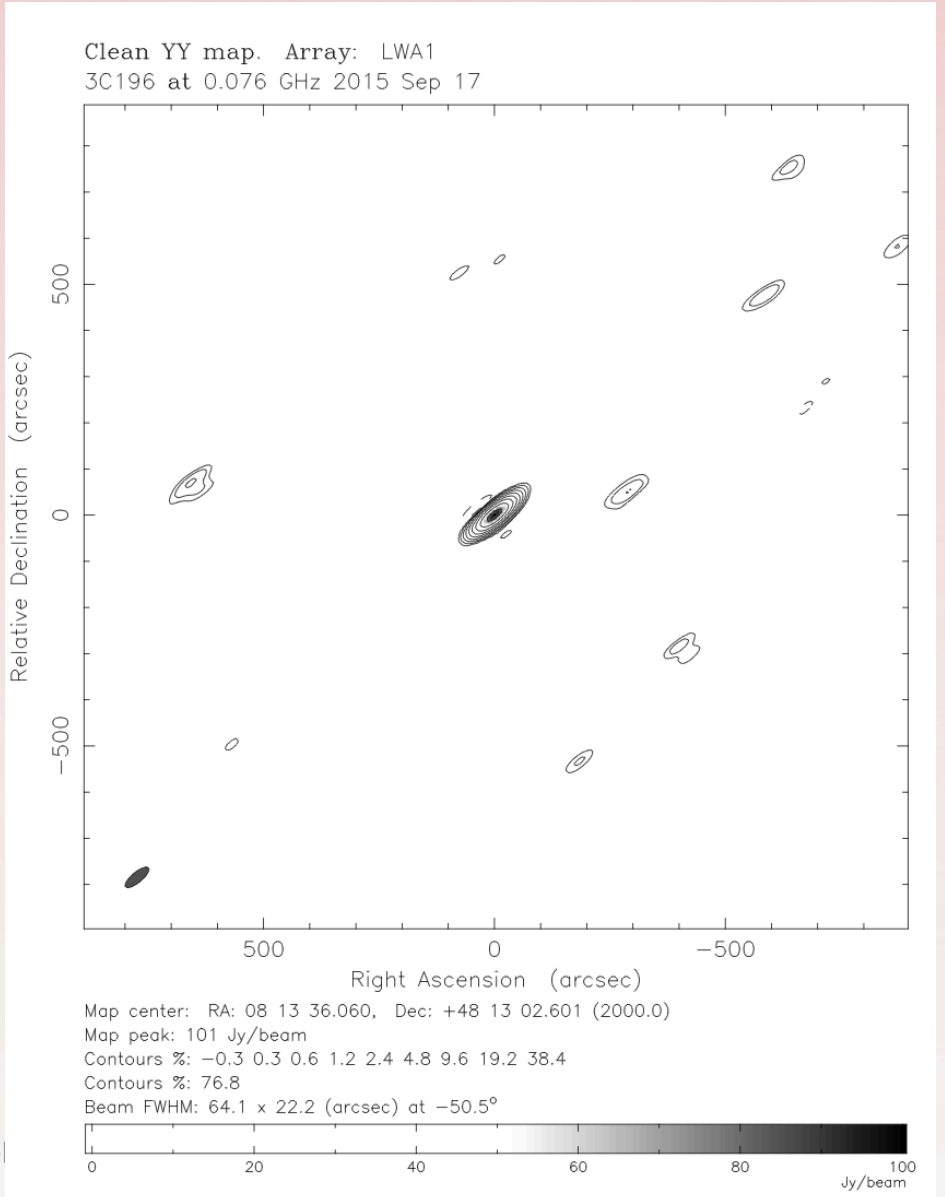
3C196

Peak ~ 100 Jy

Noise ~ 200 mJy

SEFD ~ 8000 Jy LWA1

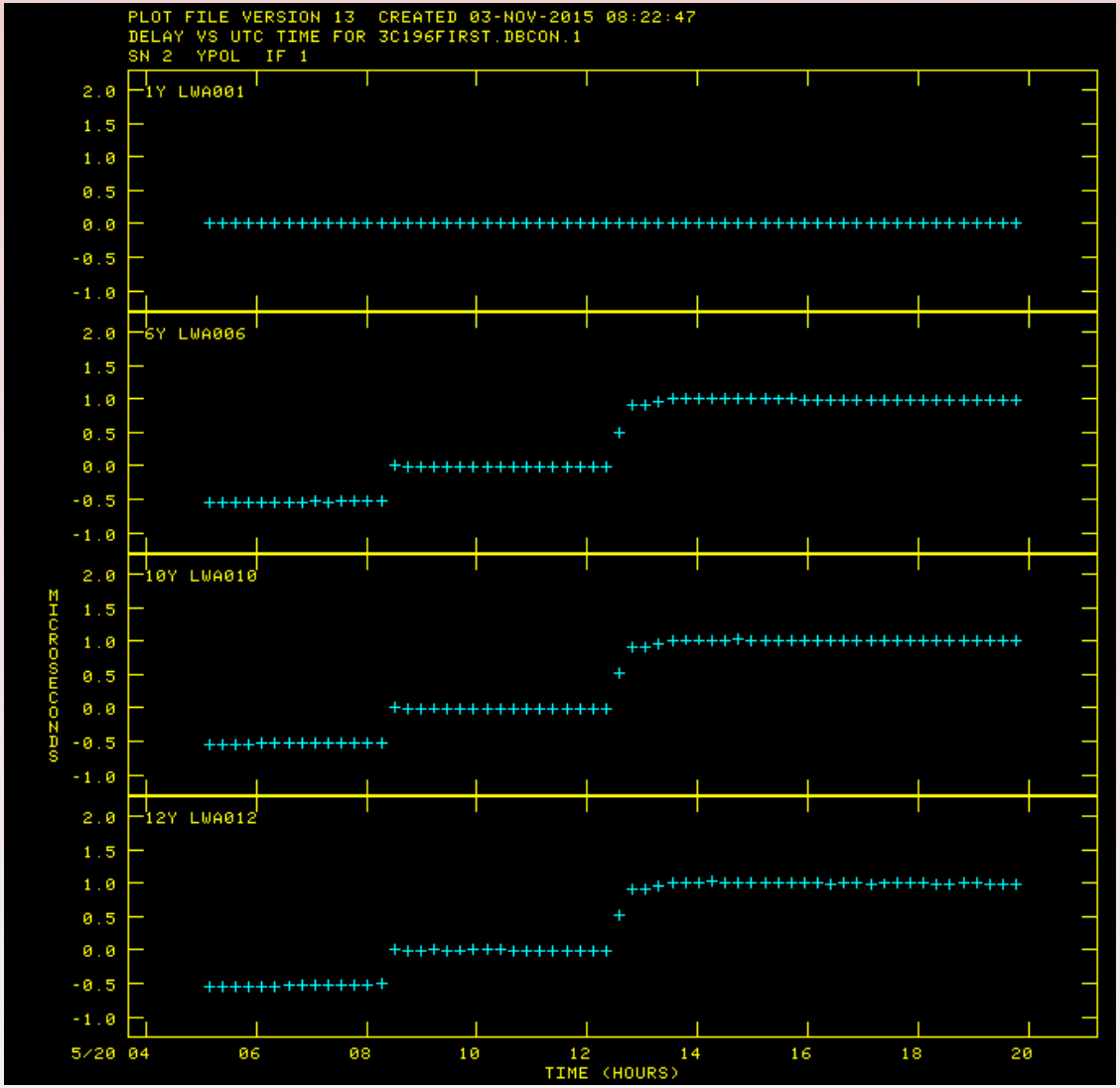
SEFD ~ 25000 Jy ea14, ea10



eLWA Demonstration

Problems:

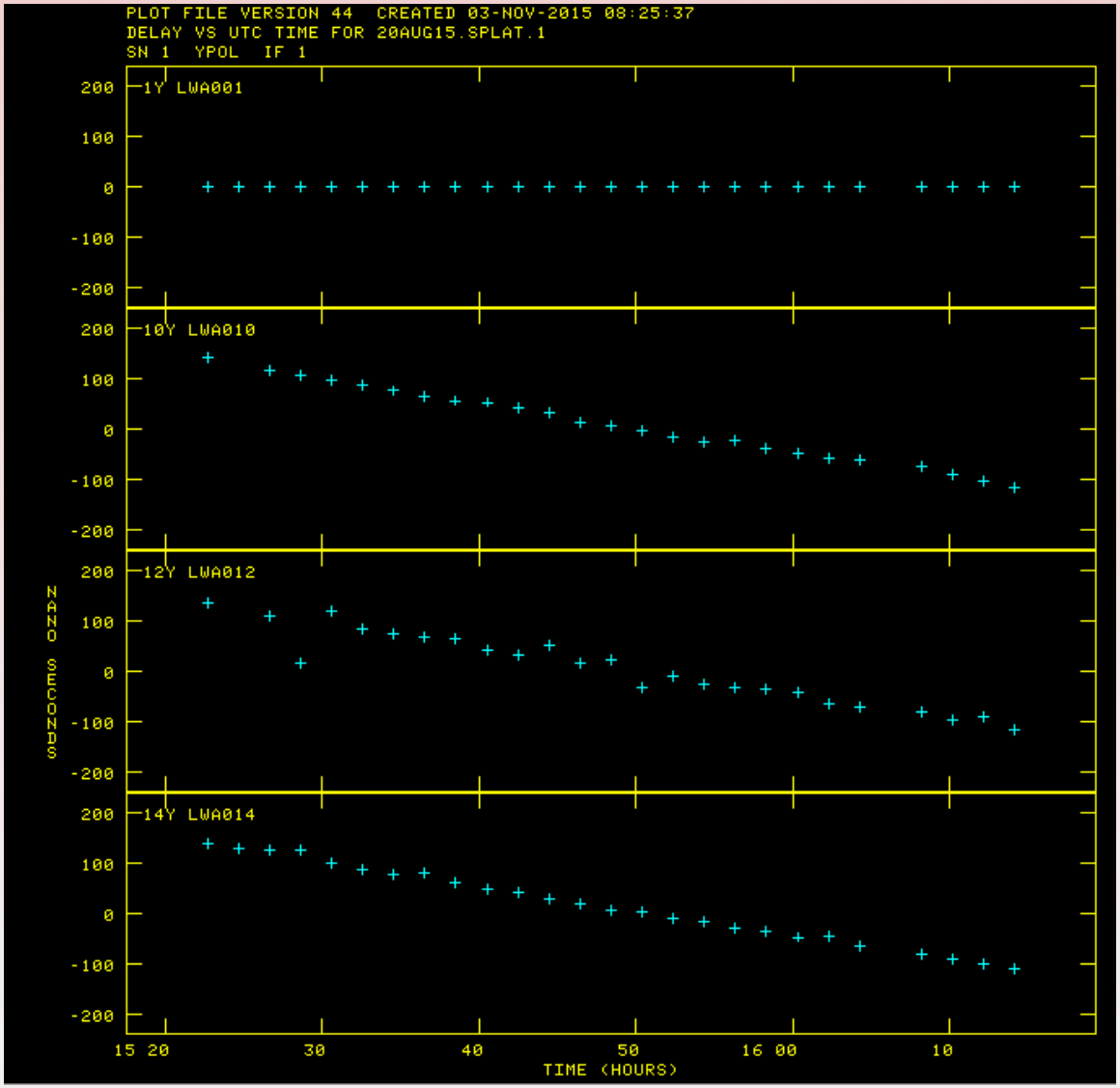
Delays sometimes jump



eLWA Demonstration

Problems:

Delays sometimes jump
Or drift

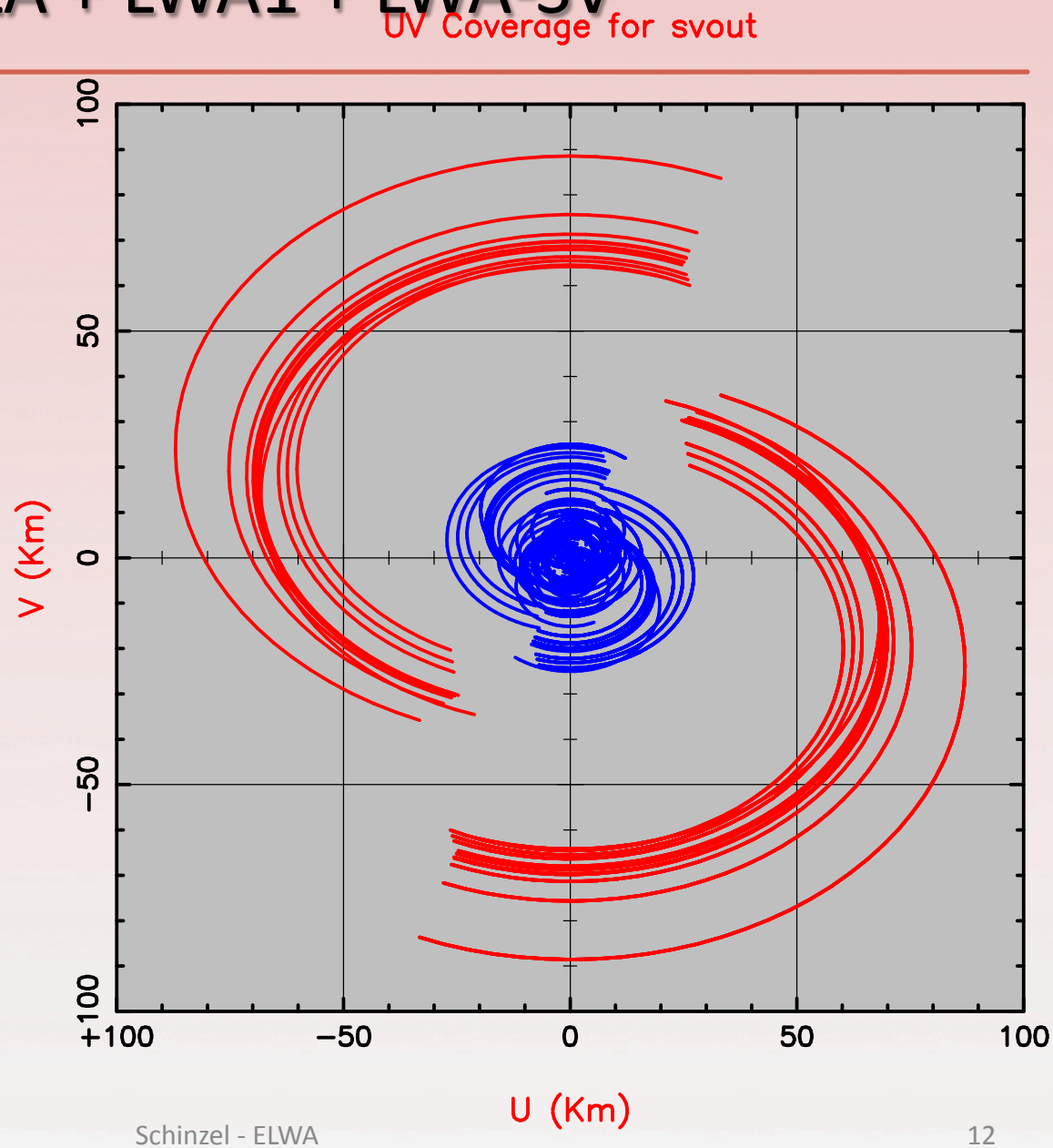


The Long Wavelength Array

LWA
Long Wavelength Array

Dec. 4th, 2015

10 VLA + LWA1 + LWA-SV



~10 arcsec resolution
at 74 MHz
~20 mJy sensitivity

Low Band Observatory – (ng)LOBO

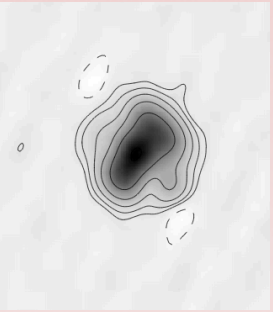
Talk by Tracy Clarke on Monday/Poster by Namir Kassim

- Commensal low frequency observing with VLA and ngVLA <1 GHz (P band + 4 band)
- Dedicated scalable correlator
- Phase 1: Today 10-14 VLA antennas + 2 LWA stations (eLWA + VLITE)
- Phase 2: 27 VLA antennas + 2+ LWA stations by the end of the decade (eLWA + LOBO)
- Phase 3: ngLOBO as low cost/high gain addition to the ngVLA

Summary

3C196

LWA1 has demonstrated technical feasibility and scientific results



Tau A

- Lots of exciting science at low frequencies. Progress requires:
  - High temporal, spectral, and spatial resolution
  - Sensitivity
  - Software development
- Current experiments are providing new hardware and software and a better understanding of the sky at long wavelengths
- **We have begun the next phase – interferometry with LWA and VLA stations**