

VLBA Status

GMVA/TOG 2022

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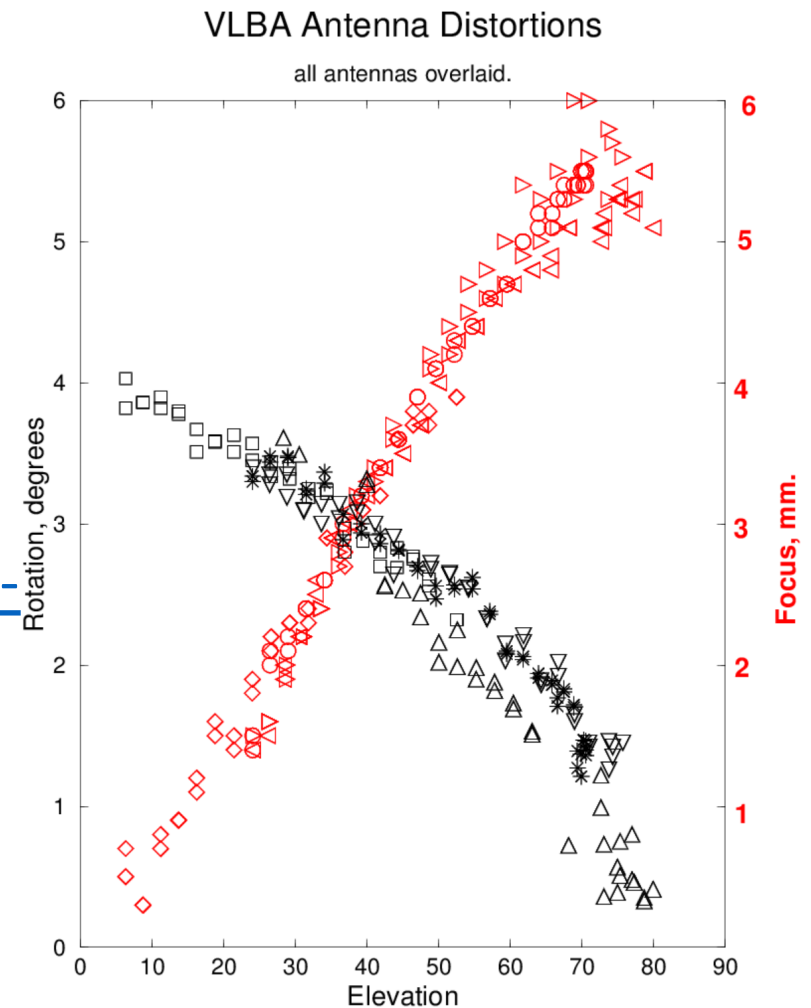
High Frequency Performance

- 7mm performance degraded from July 15 2021 to November 10 2021.
- Rotation ‘trick’ was turned on.
- Corrects rotation/collimation with elevation
- Wrong amount of correction (8 deg VLA, rather than 4 deg VLBA).
- Wrong Zero point (base collimations set at 40 deg not 90 deg).
- Not noticed due to the way single dish point presented.

Station	Fraction of nominal performance
SC	0.30
HN	0.52
NL	0.66
FD	0.60
LA	0.49
PT	0.70
KP	0.62
OV	0.64
BR	0.60
MK	0.46

High Frequency Performance

- RDBE DDC vs PFB issue pulled staff time.
- Gains available to correct flux scale if your data have been affected.
- All PIs have been contacted.
- <https://science.nrao.edu/facilities/vlba/data-processing/7mm-performance-2021>
- 2cm and 3mm not affected.
- Since correction about 10% improvement in gain.



3mm Performance

- Existing receiver issues at several sites:
 - PT LCP.
 - FD LCP.
 - NL inconsistent.
- Right at the edge of the dish performance.
- Would like more/some feedback from GMVA not based on Tsys.
- Interferometric reference pointing is being worked towards.

e-Transfer

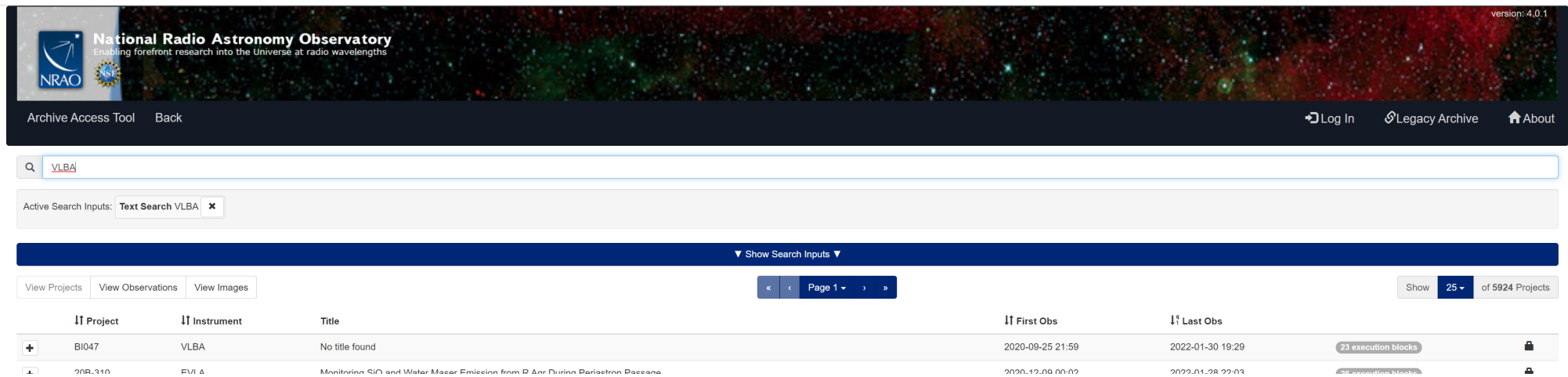
- VLBA has received increasing number of requests to support eTransfer of data.
- Working on a plan.
- Storage box with dedicated machine on a DMZ.
- Plan to support jive5ab (m5copy) and Tsunami initially.
- We will likely only support pulling to us, push/pull to external stations.
- All data will go via DSOC (nothing direct from stations).

SCHED 11.7

- Planned for release Quarter 3 this year.
- New staff member in systems group maintaining.
- Mostly small updates:
 - Decoupled website from SCHED releases
 - Updated setups/examples for 4 Gbps.
 - gfortran compilation bug fix.
 - Reininclude pgplot as part of SCHED release.
 - USNO changes.
 - Include Arecibo 12m.
 - Position/capability updates?
- Started collecting changes for VEX2

New NRAO data archive

- <https://data.nrao.edu>
- Not all VLBA data are ingested yet.
- Updates to make correlation products individually viewable/selectable.
- Ability to set custom proprietary periods.
- Old archive EOL soon...



The screenshot shows the NRAO data archive interface. At the top, there is a header with the NRAO logo and the text "National Radio Astronomy Observatory Enabling forefront research into the Universe at radio wavelengths". Below the header, there is a search bar with "VLBA" entered. The search results are displayed in a table with columns for Project, Instrument, Title, First Obs, and Last Obs. The first row shows "BI047" with "VLBA" as the instrument and "No title found" as the title. The second row shows "20R-310" with "EVI A" as the instrument and "Monitoring SiO and Water Maser Emission from P Aor During Periastron Passage" as the title. The table also includes a "Show" button set to "25" of "5924 Projects".

NRAO National Radio Astronomy Observatory
Enabling forefront research into the Universe at radio wavelengths

Archive Access Tool Back Log In Legacy Archive About

Search: VLBA

Active Search Inputs: Text Search VLBA

Show Search Inputs

View Projects View Observations View Images Page 1 of 25 of 5924 Projects

Project	Instrument	Title	First Obs	Last Obs	Execution Blocks
BI047	VLBA	No title found	2020-09-25 21:59	2022-01-30 19:29	23 execution blocks
20R-310	EVI A	Monitoring SiO and Water Maser Emission from P Aor During Periastron Passage	2020-12-00 00:00	2022-01-28 22:03	2 execution blocks

New NRAO Calibrator Search Tool



Welcome to the VLBA Calibrator Search Tool

The VLBA Calibrators List drives a search engine to find calibrators that are close to a specified position. Please fill out the *VLBA Calibrators Search Form* below. The search will return a table of sources within the search radius and a diagram showing the proximity of each source to the search center. Plots of the source visibility and image distributions are given for many sources.

CST [List Search](#)

This is the demo application for the CST *Calibrator Search Tool* on [NRAO](#).

[Reset Values](#)

RA

RA Formats: XX:YY:ZZ.ZZZ, XXhYYmZZ.ZZZs, XX YY ZZ.ZZZ

DEC

DEC Formats: XX:YY:ZZ.ZZZ, XXdYY'ZZ.ZZZ", XX YY ZZ.ZZZ

Search Radius

The maximum search radius is 45.0 degrees.

Maximum Number of Resources Returned:

Sort resulting list by:

Minimum Flux Density (Jy)

Flux Density - Observing Band:

"Result Table (Demo)"

Copy PDF CSV Show/Hide Columns

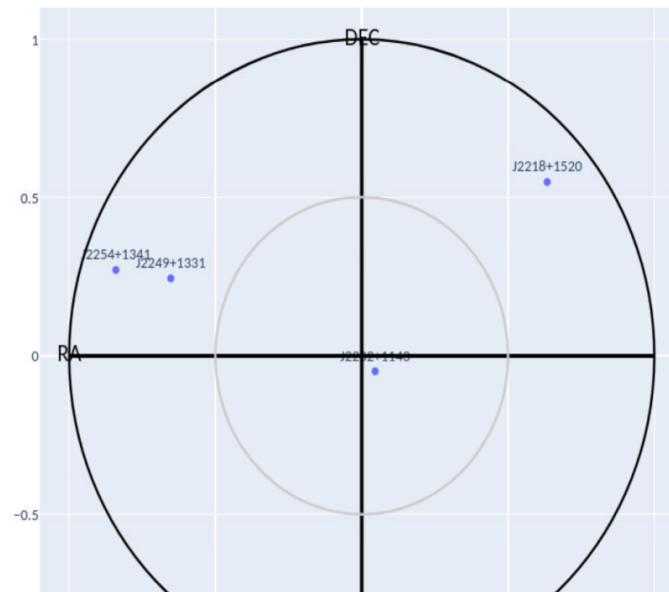
Search:

<input checked="" type="checkbox"/>	Name	X-Error (mas)	Y-Error (mas)	Separation	S Band	S Flux (Sh)	S Flux (Lg)	C Band	C Flux (Sh)	C Flux (Lg)	X Band	X Flux (Sh)	X Flux (Lg)	U Band	U Flux (Sh)	U Flux (Lg)	K Band	K Flux (Sh)	K Flux (Lg)	Ref
<input checked="" type="checkbox"/>	J2232+1143	0.03	0.04	0.40	S	5.070	1.858	C	3.769	1.411	X	3.142	1.019	U	3.361	1.831	K	4.754	2.943	ICRF3SX
<input type="checkbox"/>	J2249+1331	0.20	0.24	4.18	S	0.494	0.140	C	0.263	0.014	X	0.137	0.041	-	--	--	-	--	--	ICRF3SX
<input type="checkbox"/>	J2218+1520	0.03	0.03	5.03	S	0.558	0.528	C	0.894	0.846	X	0.938	0.810	-	--	--	K	0.930	<1.357	ICRF3SX
<input type="checkbox"/>	J2254+1341	0.07	0.13	5.30	S	0.362	0.227	C	0.346	0.204	X	0.420	0.311	U	0.530	0.450	K	0.360	<0.595	ICRF3SX

Calibrator Sources in range results

Showing 1 to 4 of 4 entries 1 row selected

Plot of sources found around search center.



J2232+1143

Alternative Names
 B1950: 2230+114
 ICRF3: J223236.4+114350
 Other: CTA102

RA: 22:32:36.40890093

DEC: +11:43:50.9040592

RAE: 0.03 (mas)

DECE: 0.04 (mas)

Origin: ICRF3SX

Flux Density

Band: S
 sh: 5.070 (Jy)
 lg: 1.858 (Jy)

Band: C
 sh: 3.769 (Jy)
 lg: 1.411 (Jy)

Band: X
 sh: 3.142 (Jy)
 lg: 1.019 (Jy)

Band: U
 sh: 3.361 (Jy)
 lg: 1.831 (Jy)

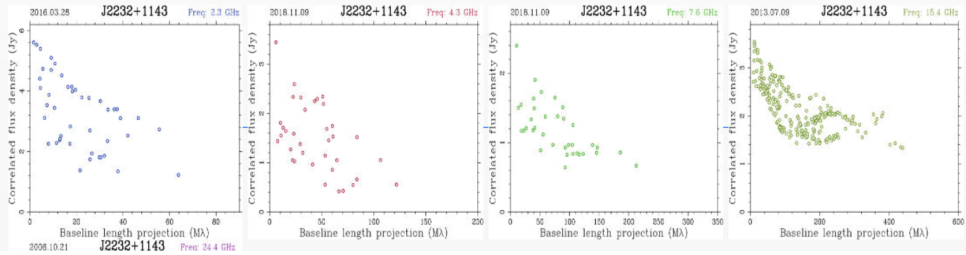
Band: K
 sh: 4.754 (Jy)
 lg: 2.943 (Jy)

SCHED Key

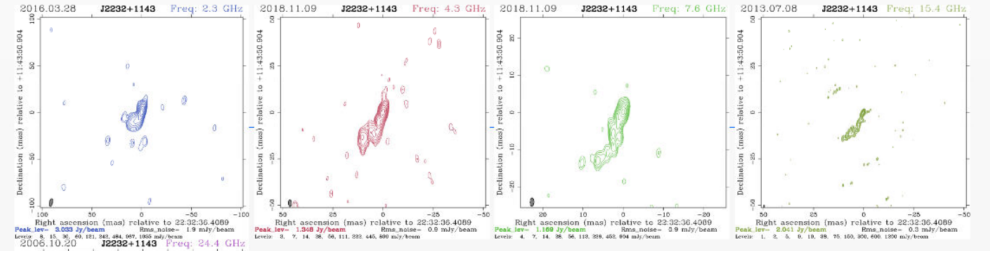
SOURCE='J2232+1143', '2230+114', 'J223236.4+114350', 'CTA102 '
 RA= 22:32:36.40890093 DEC= +11:43:50.9040592 RAERR= 0.03 DECERR= 0.04 EQUINOX = 'J2000'
 CALCODE='V'
 FLUX= 2.2, 5.070, 1.858, 5.0, 3.769, 1.411, 8.4, 3.142, 1.019, 15.2, 3.361, 1.831, 22.2, 4.754, 2.943

Copy

Visibility Plot



Contour Map



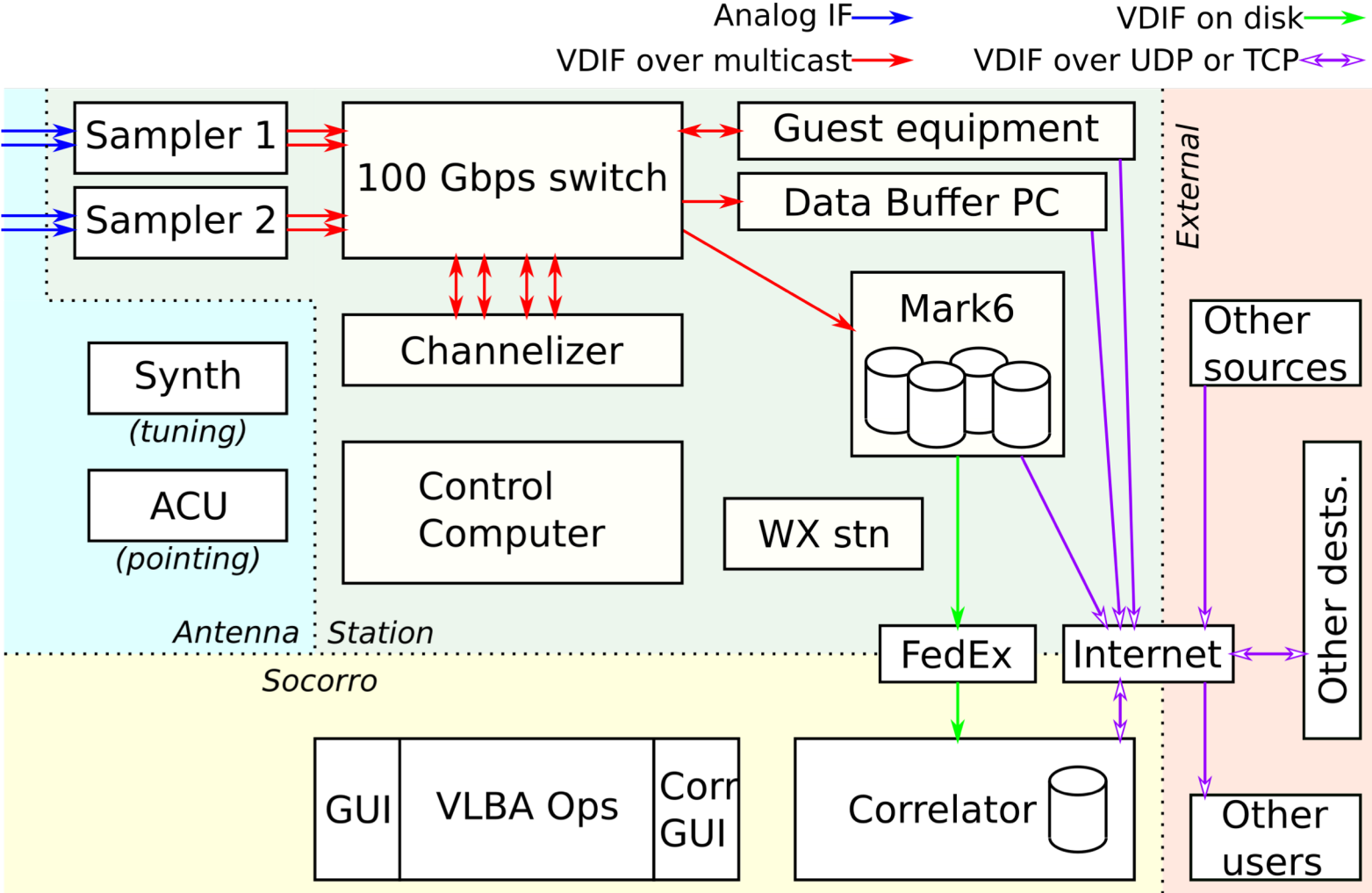
Other Items

- New staff:
 - Lilia Tremou – 10% VNDA 15 % VLBA
 - New CASA Software Engineer for VLBA starting ~June.
- VLBA basic phase referencing reduction guide in CASA:
 - https://library.nrao.edu/public/memos/vlba/sci/VLBAS_38.pdf
- VLBA CASA priorities:
 - Polarization calibration using resolved sources
 - TEC corrections for long baseline arrays
 - Overhaul of msview
 - Translating CC lists to component models
 - Pulse-cal corrections
 - User-added scan intents

VLBA New Digital Architecture (VNDA)

- Goals
 - Replace aging/obsolete RDBEs
 - Make use of “Ethernet Telescope” concepts
 - Improve RFI tolerance (more than 2 bits per sample)
 - Improve stability (single FPGA personality for all modes)
- Nominal Timescale
 - Zero-baseline test: May/June 2022
 - Preliminary Design Review: Sep 2022
 - Two prototype systems deployed: Mar 2023
 - Final Design Review: Sep 2023
 - Complete deployment: Sep 2024

VNDA Block Diagram



The next-generation Very Large Array (ngVLA)

A transformative new facility that will replace the VLA and VLBA to tackle a new Scientific Frontier:

Thermal imaging at milli-arcsec scales.

ngVLA Concept:

10x the sensitivity of the JVLA/ALMA

10x higher resolution than the JVLA/ALMA

1.2 - 116 GHz Frequency Coverage

244 x 18m + 19 x 6m offset Gregorian Antennas

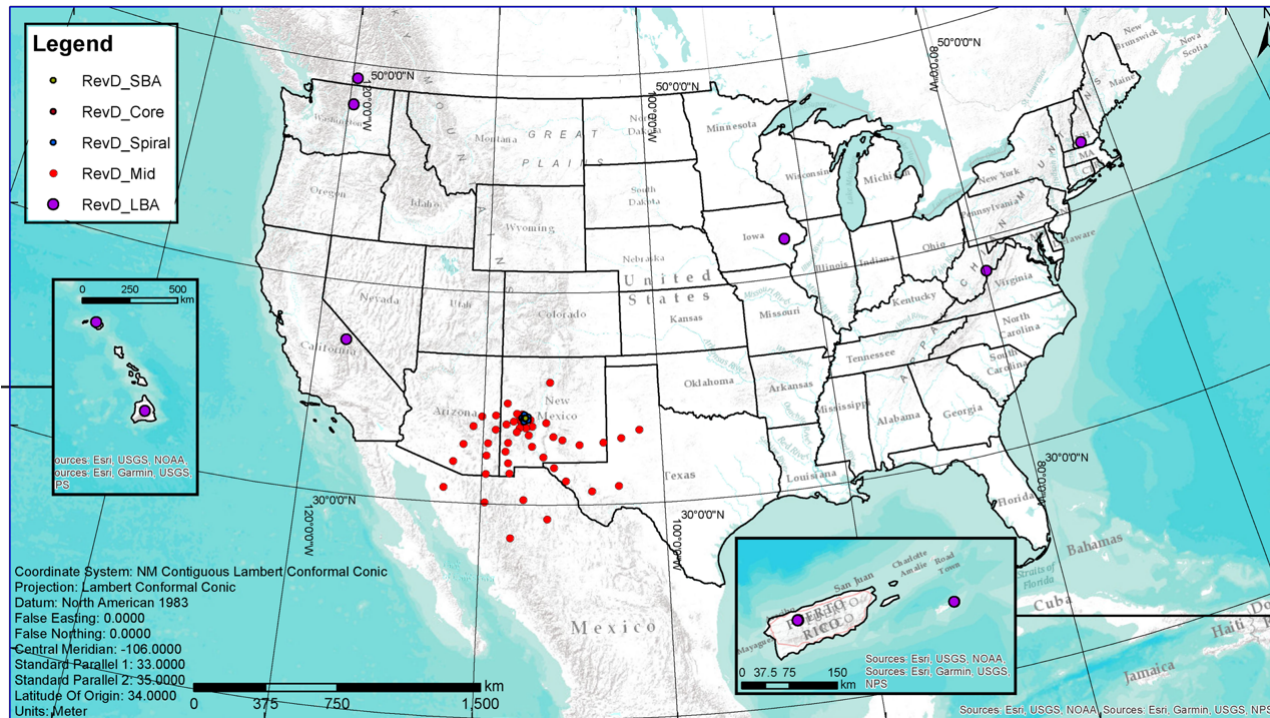
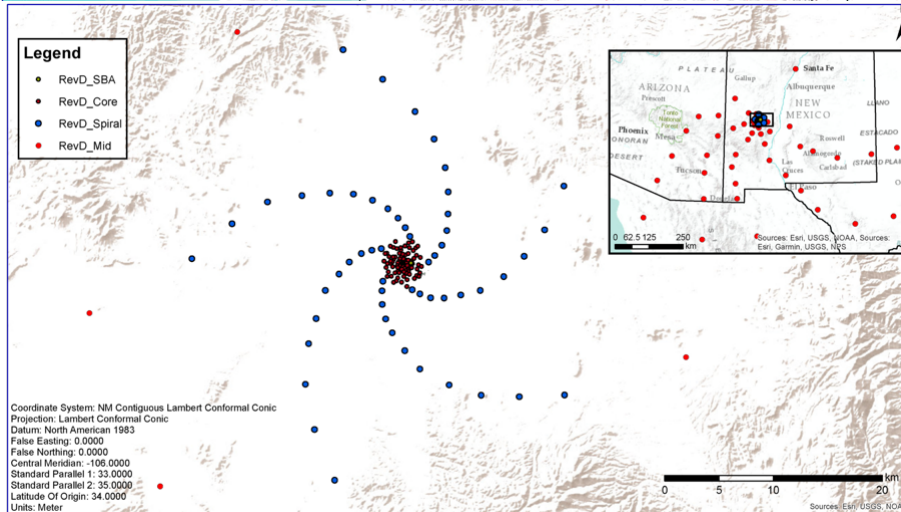
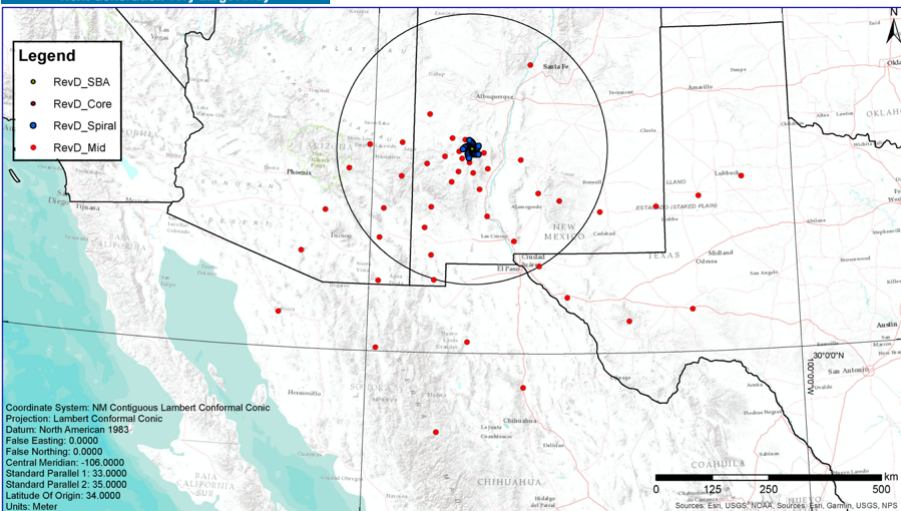
Centered at VLA site and concentrated in SW US.

Fixed antenna locations across North America.

ngVLA slides courtesy Eric Murphy;
See his talk next week at the VLBI in SKA era meeting



Distribution of Antennas



Long Baseline Antenna Locations

Qty	Location	Notes	Qty	Location	Notes
3	Puerto Rico	Arecibo Site	3	Green Bank, WV	GBO
3	St. Croix	VLBA Site	3	Brewster, WA	VLBA Site
3	Kauai, HI	Kokee Park Obs.	3	Penticton, BC	DRAO
3	Hawaii, HI	Not MK Site	3	North Liberty, IA	VLBA site
3	Hancock, NH	VLBA Site	3	Owens Valley, CA	VLBA site



Next Steps – Design/Development

- Project Declared MREFC Candidate by NSF
- Proposal for design-phase funding (FY23-FY26)
 - FY22 funding level and ramp up are critical.
- Project Conceptual Design Review (CDR) in FY22.
- Secure international partnership contributions for final design and construction. Baseline plan and work package distribution by PDR.
- Preliminary and Final Design Reviews in FY23 and FY25.