

VLA VHF-Refit Update

(cfa-www.harvard.edu/dawn)

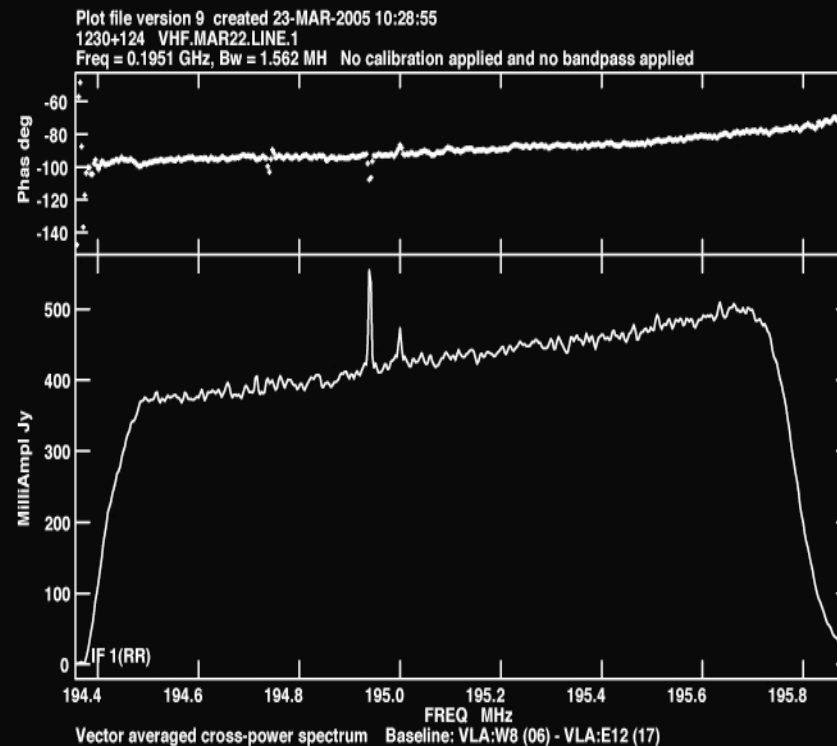
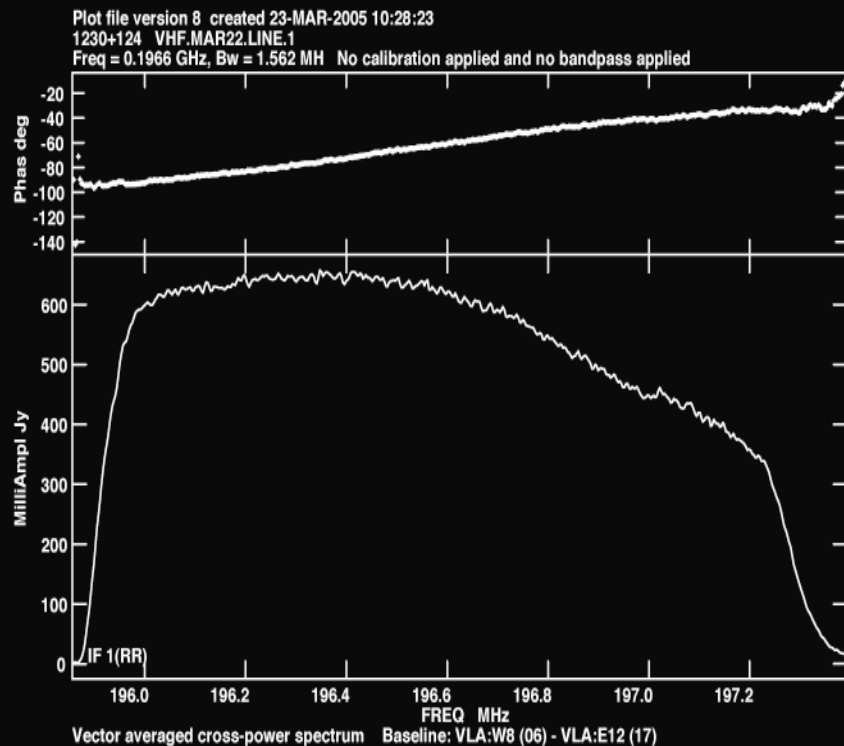
- Goal - Pathfinder w/ first science 2006
 - Image “Cosmological Strömgren Spheres”
 - Characterize statistics of T_{HI} fluctuations
- CfA funded
 - Engineering by the SAO receiver lab
 - Collaboration with NRAO (*best effort*)
- Milestones
 - Dec/Jan: design review / observing time approved, late 2005/6
 - 03/07: first 2 prototype RX’s delivered to Socorro
 - 03/09: first light, antenna 6 (W8)
 - 03/16: first light, antenna 17 (E12)
 - 03/21: first fringes, Virgo A (~ 1 km baseline)
- Present focus
 - Estimation of 20 / 92 cm impact \checkmark
 - RFI characterization \checkmark mitigation schemes
 - 200 cm performance (T_{sys} , A_e)

EoR Instruments Worldwide (<2010)

Expt.	Site	BW (MHz)	FoV(°)	A (m ²)	B (km)	Cost	HIR	δT_b	RFI
MkIV	Aus	100-200	100	1	0	¢			
WSRT	Holl.	115-165	6	7000	3	\$	test		✓
GMRT	India	150-165	4	2×10^4	1	\$	×		✓
PAST	Tibet	70-200	10	8×10^4 (1 polz)	10	\$		×	
VLA	NM	180-200	4	6600	1	¢	×	×	✓
MWA	Aus	80-200*	30	8000	1	\$\$	×	×	
LOFAR	Holl.	115-200*	10	10^5	2 ⁺⁺	\$\$\$	×	×	✓

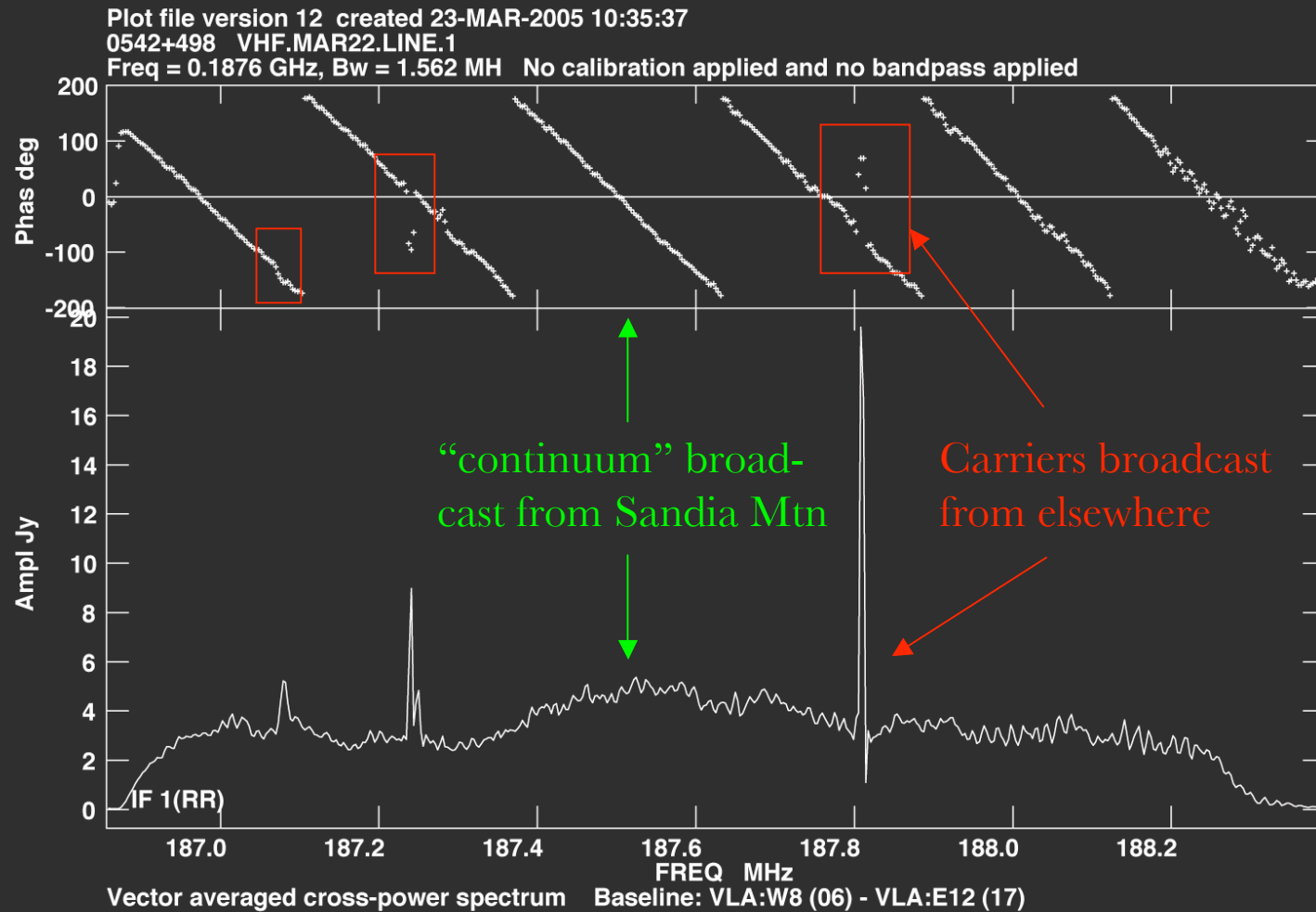


2-Band Fringes: Virgo A

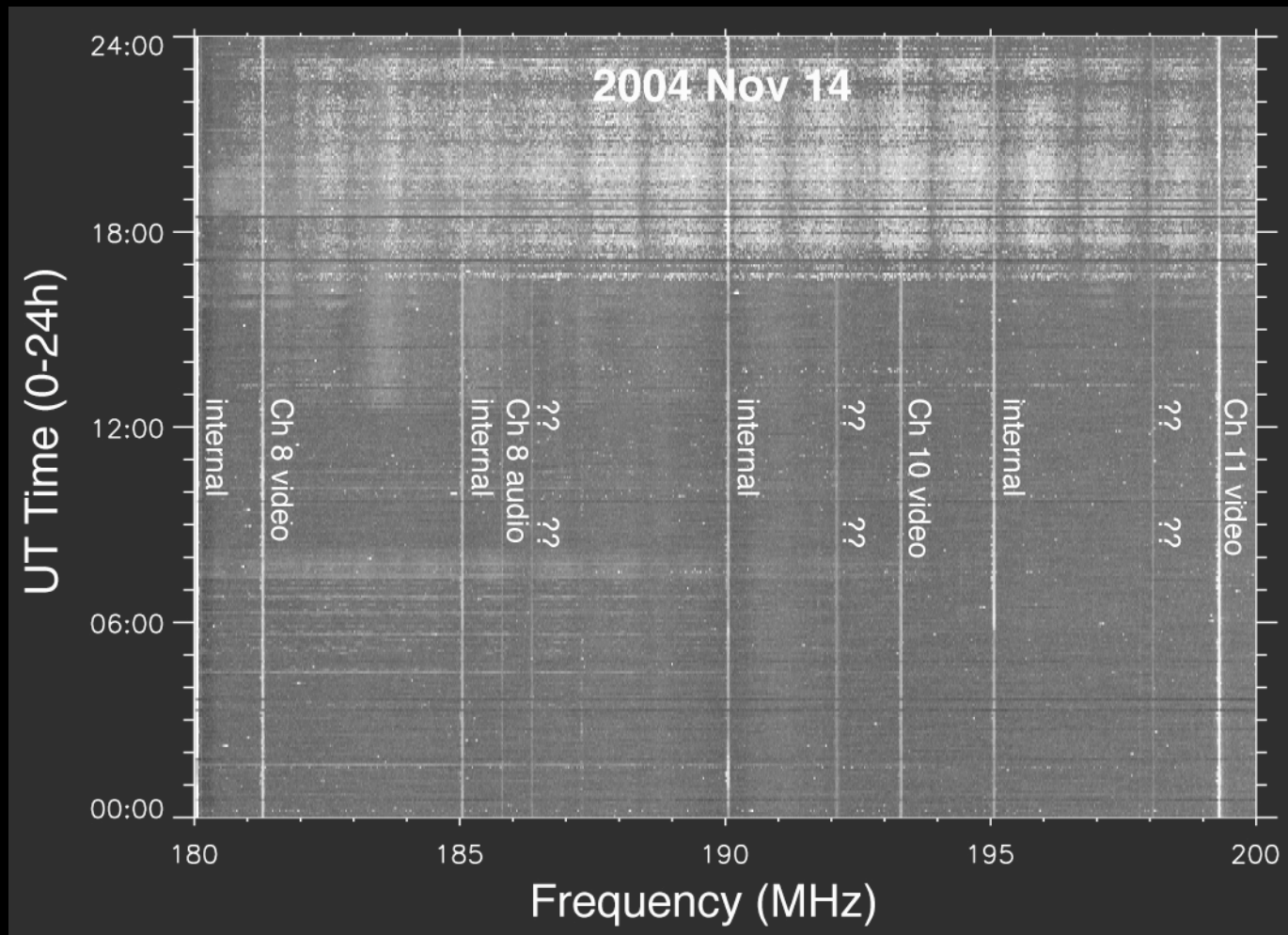


~ 1000 Jy
Antennas 6, 17
1.56 MHz BW
Two “clean” bands

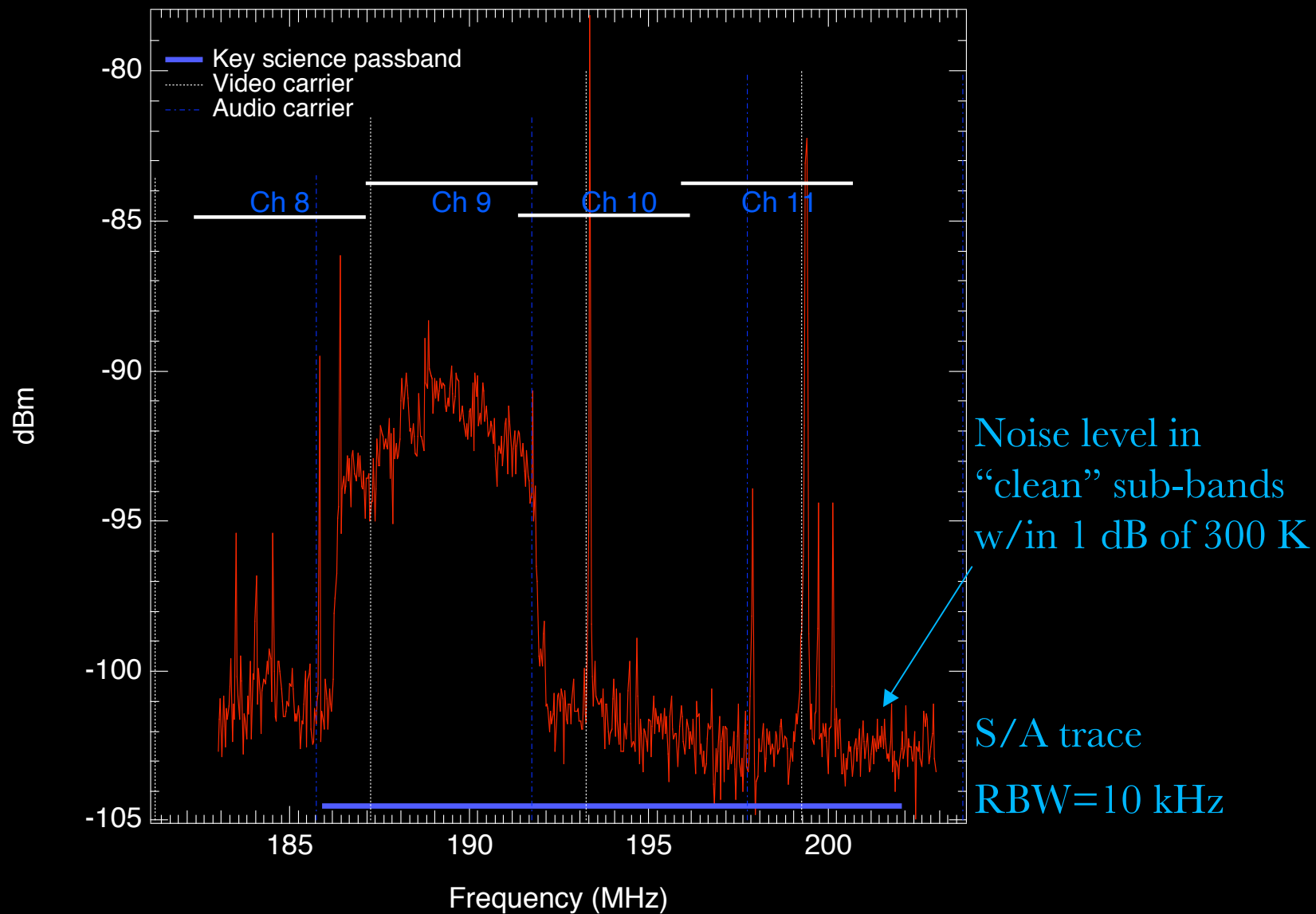
Fringes on KNMD TV



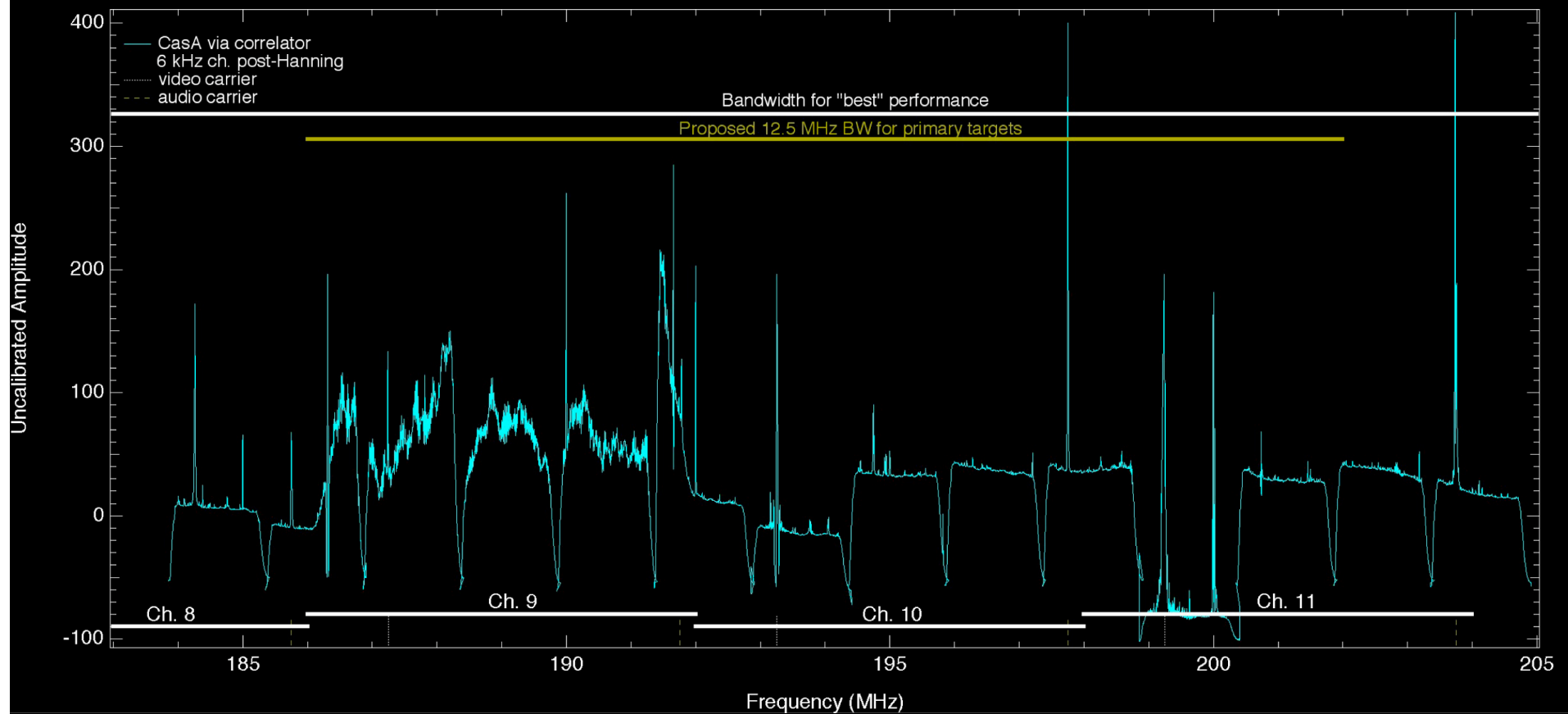
RFI - What We Expected



RFI - What We Got



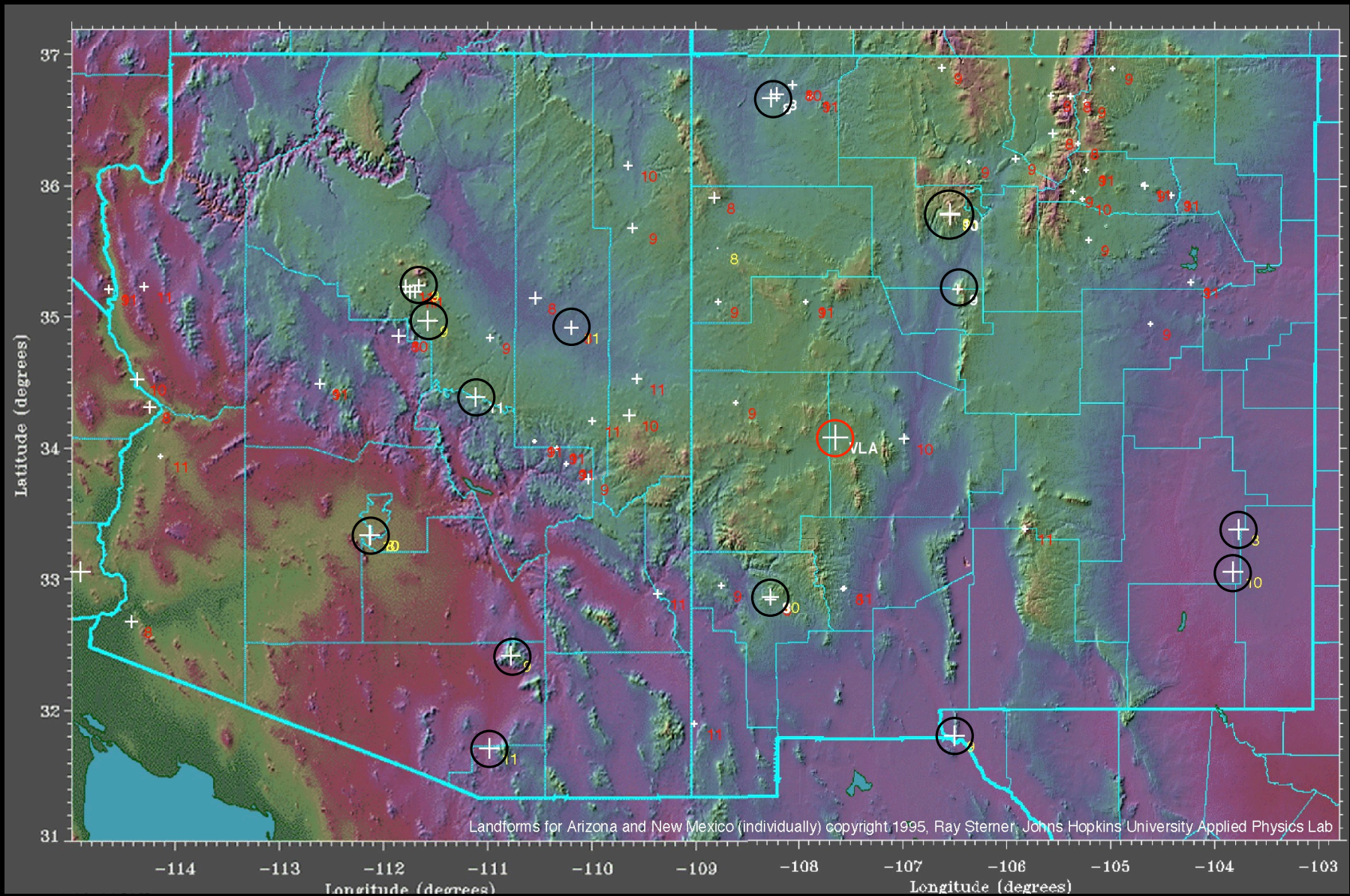
RFI - What We Got



Correlator trace

RBW=10 kHz

Why Pay for Cable?



Todo

- Complete 2-band performance measures
 - confirm improved performance induced in existing P-band receiving system.
- Study/test RFI mitigation tactics
 - coordination (e.g., KNMD educational)
 - high-Q notch filtering
 - Subtraction (reference antennas)
- Deploy prototypes for 3rd and 4th antennas
 - Re-engineer as needed to equalize RCP & LCP cals

