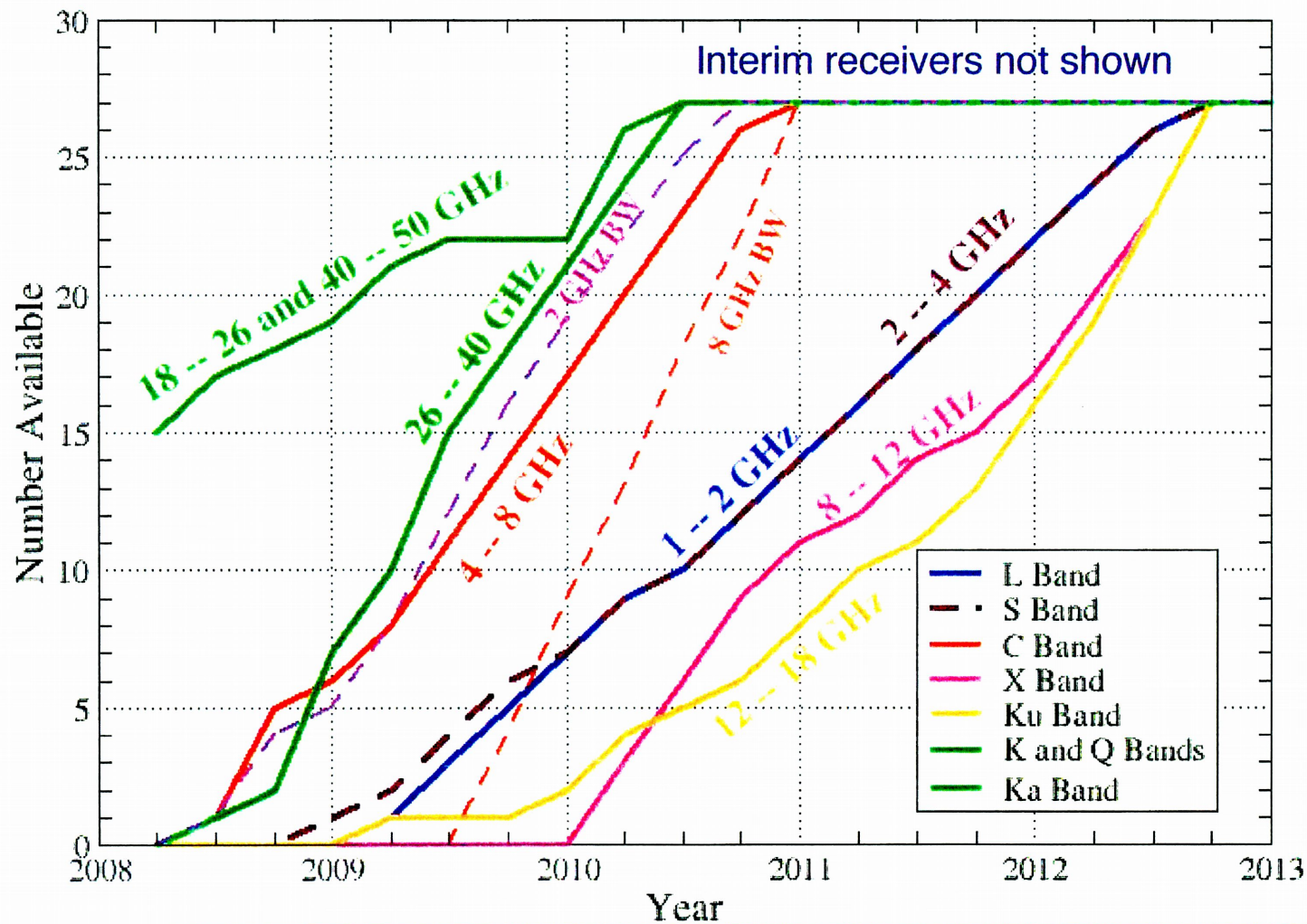


Tables & useful details

Schedule: Growth of New Capability



Efficiency and Tsys Results

	Band (GHz)	Tsys		Aperture Effic.	
		Req'd	Actual [#]	Req'd	Actual [#]
L	1 – 2	26	TBD	.45	0.40 – 0.45
S	2 – 4	26	24 – 28*	.62	~0.52*
C	4 – 8	26	24 -- 31	.56	.53 -- .61
X	8 -- 12	30	TBD	.56	TBD
Ku	12 -- 18	37	TBD	.54	TBD
K	18 -- 26.5	59	36 -- 42	.51	.57 -- .48
Ka	26.5 -- 40	53	40 -- 50	.39	.48 -- .36
Q	40 -- 50	74 -- 116	55 -- 100	.34	.37 -- .28

Blue = System tested and in place, or under installation.

Red = Prototypes to be tested in 2009

* Preliminary result

Range over the band

SEFD & sensitivity results

	Band (GHz)	SEFD/Jy		Sensitivity/ 1σ , 9hrs	
		Req'd	Actual [#]	Full BW μ Jy	1 km/s mJy
L	1 – 2	325	TBD	1.6	0.5
S	2 – 4	235	~280*	~1.0*	~0.6*
C	4 – 8	260	275	0.7	0.3
X	8 -- 12	300	TBD	0.8	0.3
Ku	12 -- 18	385	TBD	0.8	0.3
K	18 -- 26.5	650	420	0.75	0.25
Ka	26.5 -- 40	760	600	1.1	0.29
Q	40 -- 50	1570	1310	2.3	0.76

Blue = System tested

Red = Prototypes to be tested in 2009

* Preliminary result

Rough average over the band

$$\text{SEFD} = 5.62 T_{\text{sys}}/\epsilon$$

$$\sigma = \text{SEFD}/[\eta_c N_A \sqrt{B\tau}]$$

$$\eta_c = 0.91 \text{ (4-bit)}$$

$$N_A = 27$$



OSRO WIDAR modes (1)

- Continuum applications and spectro-polarimetry
 - Two independently-tunable sub-band pairs (IFs), full pol., each with bandwidth $128/2^n$ MHz ($n=0,\dots,12$), 64 channels

Sub-band BW (MHz)	Number of poln. products	Number of channels/poln product	Channel width (kHz)	Channel width (kms ⁻¹ at 1 GHz)	Total velocity coverage (kms ⁻¹ at 1 GHz)
128	4	64	2000	600/v(GHz)	38,400/v(GHz)
64	4	64	1000	300	19,200
32	4	64	500	150	9,600
16	4	64	250	75	4,800
8	4	64	125	37.5	2,400
4	4	64	62.5	19	1,200
2	4	64	31.25	9.4	600
1	4	64	15.625	4.7	300
0.5	4	64	7.813	2.3	150
0.25	4	64	3.906	1.2	75
0.125	4	64	1.953	0.59	37.5
0.0625	4	64	0.977	0.29	18.75
0.03125	4	64	0.488	0.15	9.375

OSRO WIDAR modes (2)

- Spectral line applications
 - One tunable sub-band pair (IF), dual polarization, with bandwidth $128/2^n$ MHz ($n=0,\dots,12$), 256 channels

Sub-band BW (MHz)	Number of poln. products	Number of channels/poln product	Channel width (kHz)	Channel width (km s^{-1} at 1 GHz)	Total velocity coverage (km s^{-1} at 1 GHz)
128	2	256	500	$150/\nu(\text{GHz})$	$38,400/\nu(\text{GHz})$
64	2	256	250	75	19,200
32	2	256	125	37.5	9,600
16	2	256	62.5	19	4,800
8	2	256	31.25	9.4	2,400
4	2	256	15.625	4.7	1,200
2	2	256	7.813	2.3	600
1	2	256	3.906	1.2	300
0.5	2	256	1.953	0.59	150
0.25	2	256	0.977	0.29	75
0.125	2	256	0.488	0.15	37.5
0.0625	2	256	0.244	0.073	18.75
0.03125	2	256	0.122	0.037	9.375

RSRO: T1 2010-T2 2011

Date	Array Config	Total bandwidth per pol'n	Number of subband pairs	Channels per sb pair (4 pp)	Comments
T1 2010	D	1 GHz	16	64	All sb identical 8-bit samplers
T2 2010	C	8 GHz	64	64	All sb identical 3-bit samplers
T3 2010	B	8 GHz	64	$\leq 16,384$	All sb identical Add recirculation
T1 2011	A	8 GHz	64	$\leq 16,384$	Independent subbands
T2 2011	D	8 GHz	64	$\leq 16,384$	Can trade subbands for channels

Potential Areas of RSRO Participation

- Development of correlator modes
 - General correlator resource allocation
 - Multiple spectral lines for Galactic and extragalactic applications
 - Solar observing
 - Planetary observing
 - Astrometry
 - Phased array and VLBI
 - Pulsars
- Development of observing and calibration strategies
 - Wideband calibration methods
 - High frequency calibration
 - Improved referenced pointing
 - Ionospheric calibration
 - Calibrator models
 - Polarimetry
 - Mosaicing
 - RFI excision
- Development of data reduction strategies and algorithms
 - Automated flagging
 - Wideband, wide-field imaging
 - High dynamic range imaging
 - Algorithm development
 - Algorithm implementation
 - Post-processing computing and networking optimization
 - On-the-fly imaging

RSRO requirements

- At least one expert from each participating group must be in residence in Socorro
 - must contribute effectively to commissioning
 - limited support for salaries or accommodation may be available
- Proposals will have three parts:
 1. Scientific justification, to be peer reviewed as part of NRAO's current time allocation process
 2. Technical section describing personnel and expertise to be involved in the residency, to be reviewed by NRAO staff
 3. Budget specifying the level and nature of any support requested from NRAO; proposals that do not require Observatory support will have a substantial advantage over those that request NRAO resources

RSRO details

- Time available:
 - Up to 25% of the time available for astronomy will go to RSRO programs (~100 hours/month)
- Residency:
 - Minimum of *one month* of resident commissioning effort required for every *20 hours* of time allocated, minimum residency of *3 months*
 - May take place before the observations, but observers must be present for observations
 - An EVLA commissioning staff collaborator will not satisfy the residency requirement
 - Graduate students will not (in general) satisfy the residency requirement
 - Resident personnel will work under NRAO management with well-defined deliverables

RSRO capabilities: per subband, no recirculation

- In the end WIDAR will provide 64 completely independent subband pairs (independent tuning, bandwidth, pol'n products, etc.)

Sub-band BW (MHz)	Number of poln. products	Number of channels/poln product	Channel width (kHz)	Channel width (kms ⁻¹ at 1 GHz)	Total velocity coverage (kms ⁻¹ at 1 GHz)
128	4	64	2000	600/v(GHz)	38,400/v(GHz)
64	4	64	1000	300	19,200
32	4	64	500	150	9,600
16	4	64	250	75	4,800
8	4	64	125	37.5	2,400
4	4	64	62.5	19	1,200
2	4	64	31.25	9.4	600
1	4	64	15.625	4.7	300
0.5	4	64	7.813	2.3	150
0.25	4	64	3.906	1.2	75
0.125	4	64	1.953	0.59	37.5
0.0625	4	64	0.977	0.29	18.75
0.03125	4	64	0.488	0.15	9.375

RSRO capabilities: per subband, with recirculation

- In the end WIDAR will provide 64 completely independent subband pairs (independent tuning, bandwidth, pol'n products, numbers of channels, etc.)

Sub-band BW (MHz)	Number of poln. products	Number of channels/poln product	Channel width (kHz)	Channel width (kms ⁻¹ at 1 GHz)	Total velocity coverage (kms ⁻¹ at 1 GHz)
128	4	64	2000	600/v(GHz)	38,400/v(GHz)
64	4	128	500	150	19,200
32	4	256	125	37.5	9,600
16	4	512	31.25	9.4	4,800
8	4	1024	7.813	2.3	2,400
4	4	2048	1.953	0.59	1,200
2	4	4096	0.488	0.15	600
1	4	8192	0.122	0.037	300
0.5	4	16384	0.031	0.0092	150
0.25	4	16384	0.015	0.0046	75
0.125	4	16384	0.0076	0.0023	37.5
0.0625	4	16384	0.0038	0.0011	18.75
0.03125	4	16384	0.0019	0.00057	9.375

Upcoming Proposal Deadlines

- VLA correlator will be turned off at the end of the next D-configuration, January 2010
 - see “EVLA Information for Astronomers” web page, at <http://www.aoc.nrao.edu/evla/astro/>
- Configuration cycle will also reverse at this time, from $A \rightarrow B \rightarrow C \rightarrow D$ to $D \rightarrow C \rightarrow B \rightarrow A$
- June 1, 2009: proposal deadline for the last VLA D-configuration
- October 1, 2009: proposal deadline for the first EVLA D-configuration
- October 1, 2009: first call for RSRO proposals