Specs: Jansky VLA Survey Capabilities

- VLA performance for large-area mosaics (100 μJy rms*, natural weighting):

*Using VLA sensitivity calculator

Band (freq)	Bandwidth	t_{int} sec	θ_{PB}	θ_{res} (B)	SS deg^2/hr	$\dot{\theta}$ arcmin/s
P (230-470 MHz)	200MHz	8553	122′	24.0″	0.98	0.01
L (1-2 GHz)	600MHz	37	30.00′	5.6″	13.90	0.65
S (2-4 GHz)	1500MHz	7.7	15.00′	2.7″	16.53	1.56
C (4-8 GHz)	3.03GHz	4.4	7.50′	1.3″	7.21	1.36
X (8-12 GHz)	3.50GHz	3.9	4.50′	0.78″	2.96	0.93
K_u (12-18 GHz)	5.25GHz	3.5	3.00′	0.55″	1.45	0.68
K (18-26.5 GHz)	7.20GHz	7.0	2.05′	0.36″	0.34	0.23
K_a (26.5-40 GHz)	7.20GHz	9.5	1.45′	0.25″	0.12	0.12
Q (40-50 GHz)	7.20GHz	50	1.00′	0.18″	0.011	0.02

FAQ: Effective beam area for mosaicking speed is ½ PB area: $\Omega_B = 0.5665\ \theta_{PB}^2$

Sampler mode, RFI-free bandwidth

Integration time to reach 100μJy

Primary beam FWHM

Resolution, A-config, natural wt.

Survey Speed in deg^2 /hr at 100μJy image rms

On-the-fly scan rate

Assembling the Survey – Example

- **Multi-Tier Survey** (integration/dwell times) **Total 5614 (7017) hours**
  - Tier 1 : 30000 deg^2 all-sky
    - S1 – 2-4GHz in 2 configs to 100μJy (1815h)
  - Tier 2 : 10000 deg^2
    - S2 – 2-4GHz in 2 epochs at 100μJy (1210h) [58 μJy S2+S1]
    - C2 – 4-8GHz in 2 config (B/D 8mos apart) at 100μJy (1400h)
  - Tier 3 : 1000 deg^2 split into Gal Plane, Gal Cap, targets (Virgo? M31?)
    - S3 – 2-4GHz in 6 epochs at 100μJy (363h) [33 μJy S3+S2+S1]
    - C3 – 4-8GHz in 3 epochs at 100μJy (416h) [50 μJy C3+C2]
    - X3 – 8-12GHz in 1 epoch at 100μJy (338h)
    - L3 – 1-2GHz in 2 configs (A/C or B/D) at 100μJy (72h)
  - Science Case: multiple, see VLASS White Papers!
  - This "Survey" is intended as an example only, not a proposal.

See White Papers: Hales et al., Jarvis et al., Myers, Richards et al., Wang et al.