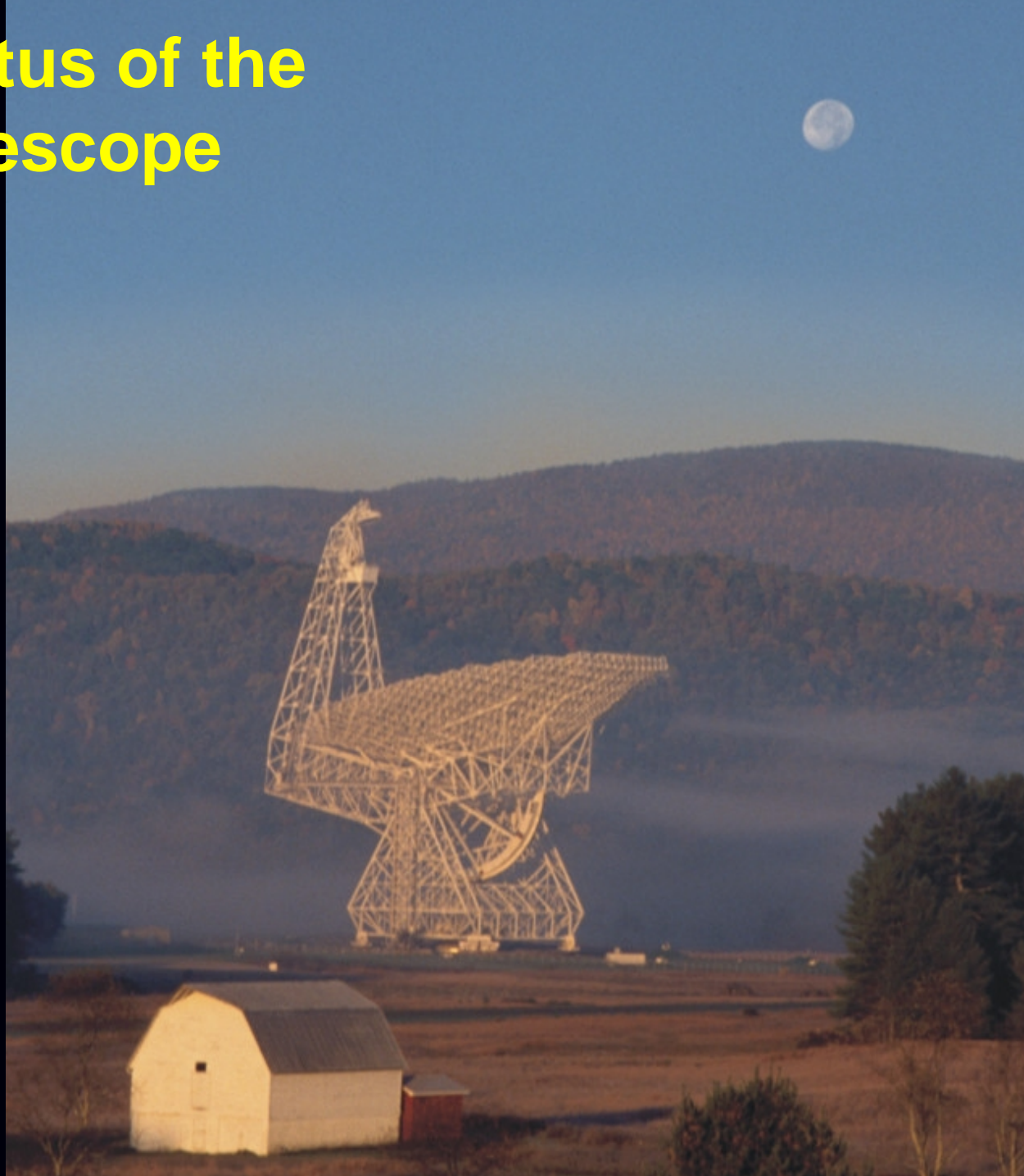
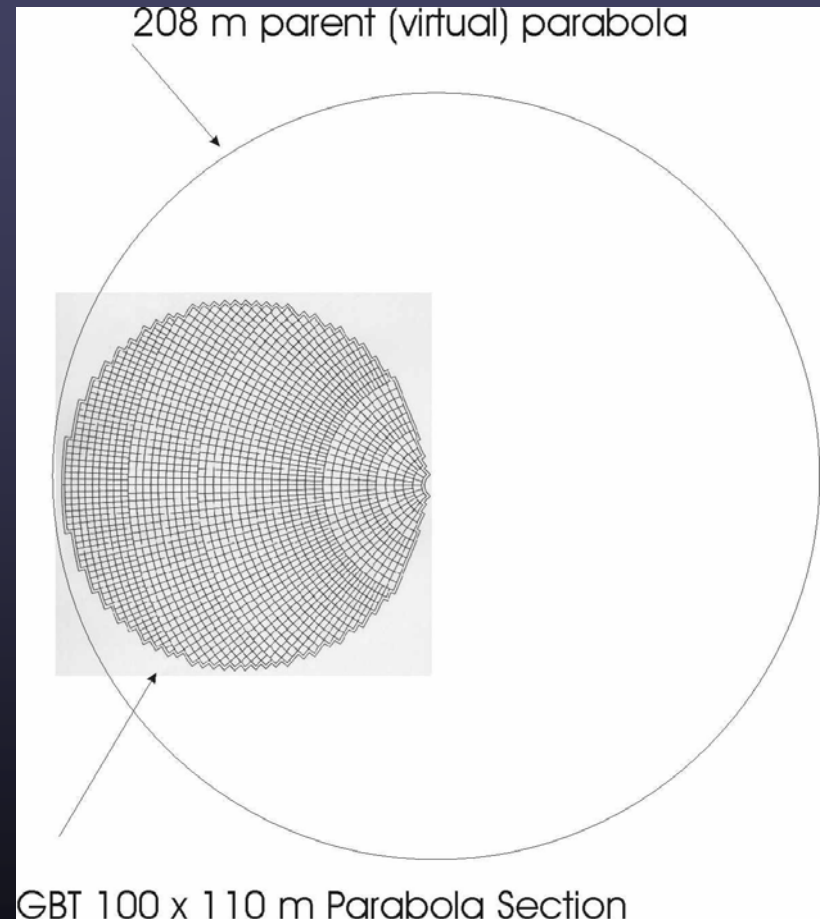
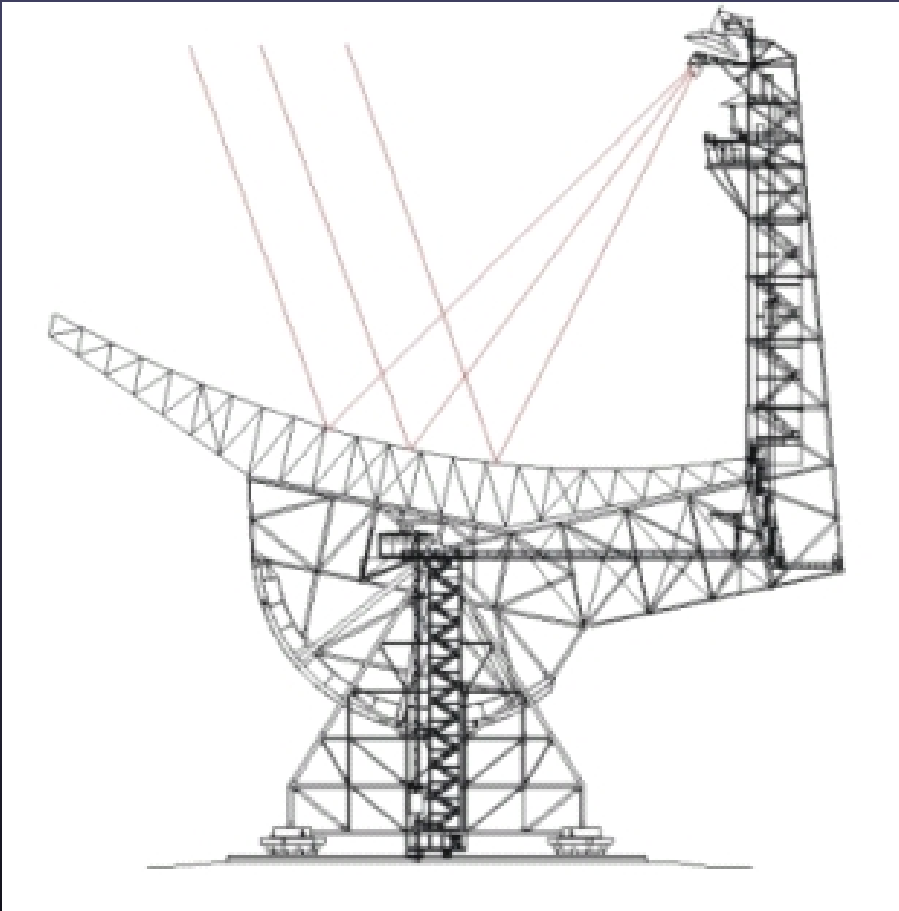


The Current Status of the Green Bank Telescope

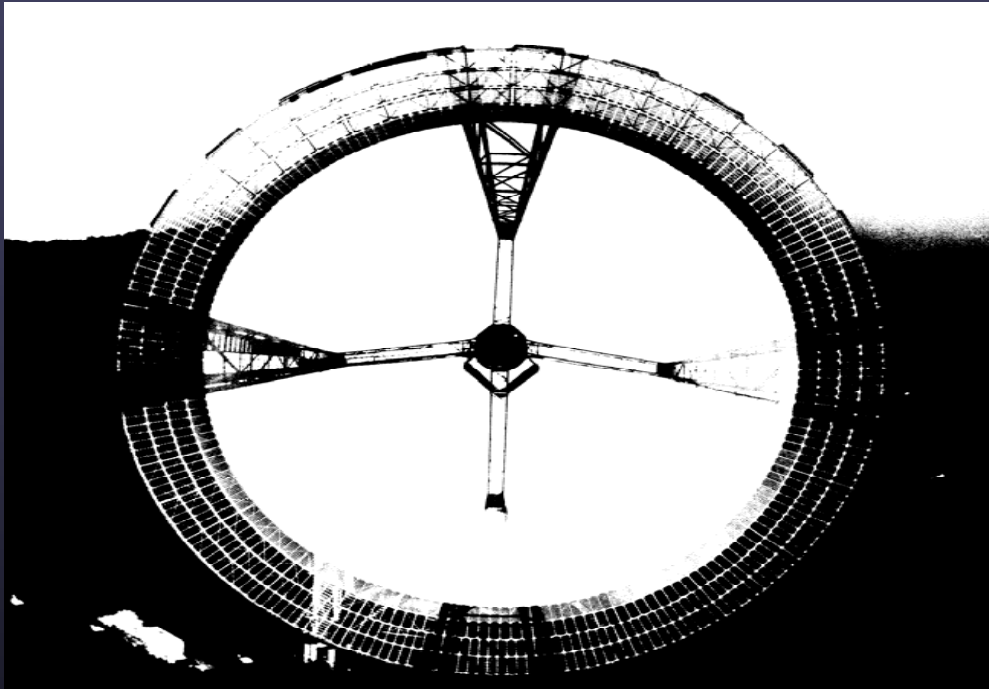


URSI
5 Jan 2004, Boulder CO

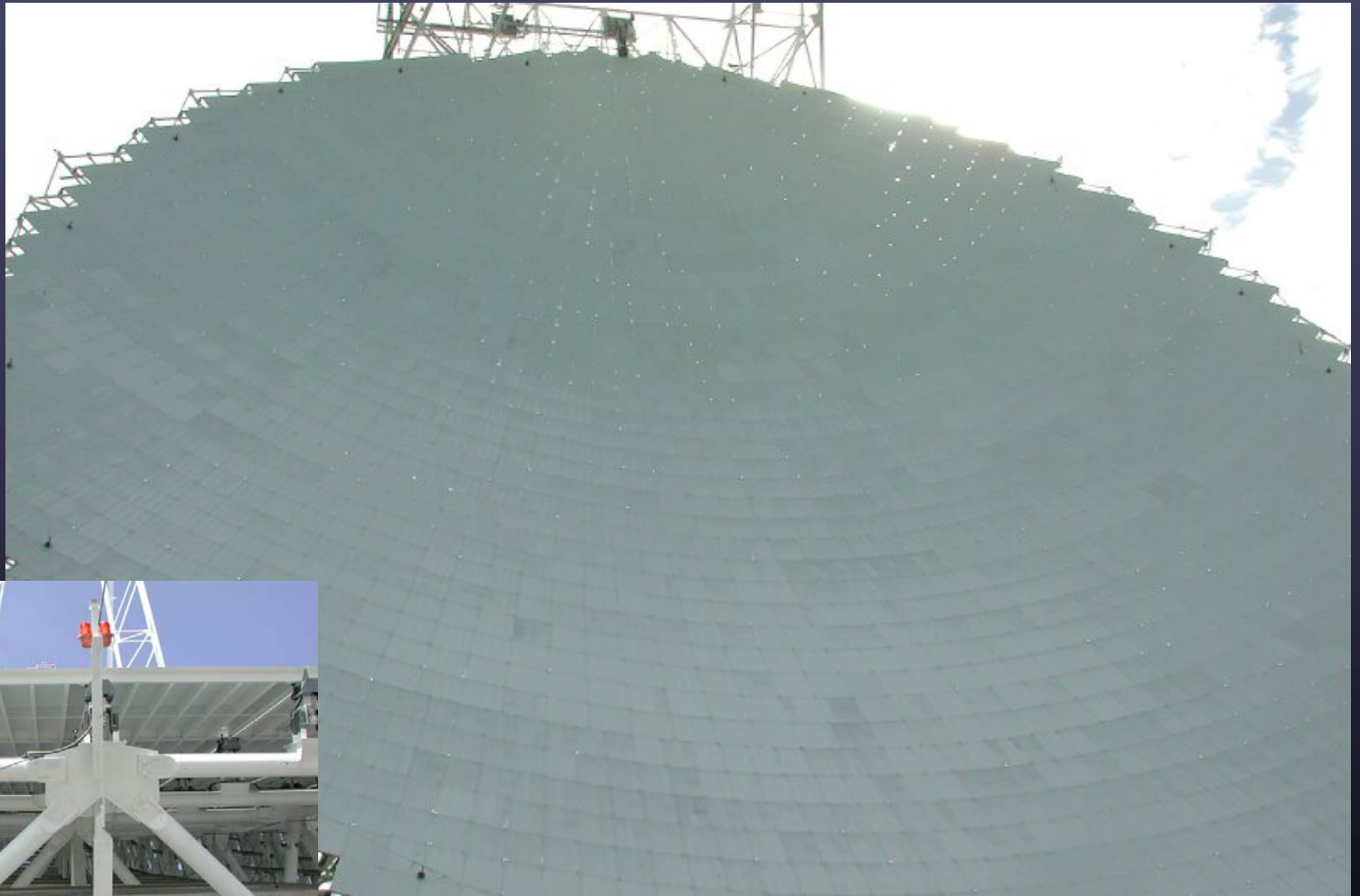
Telescope Structure



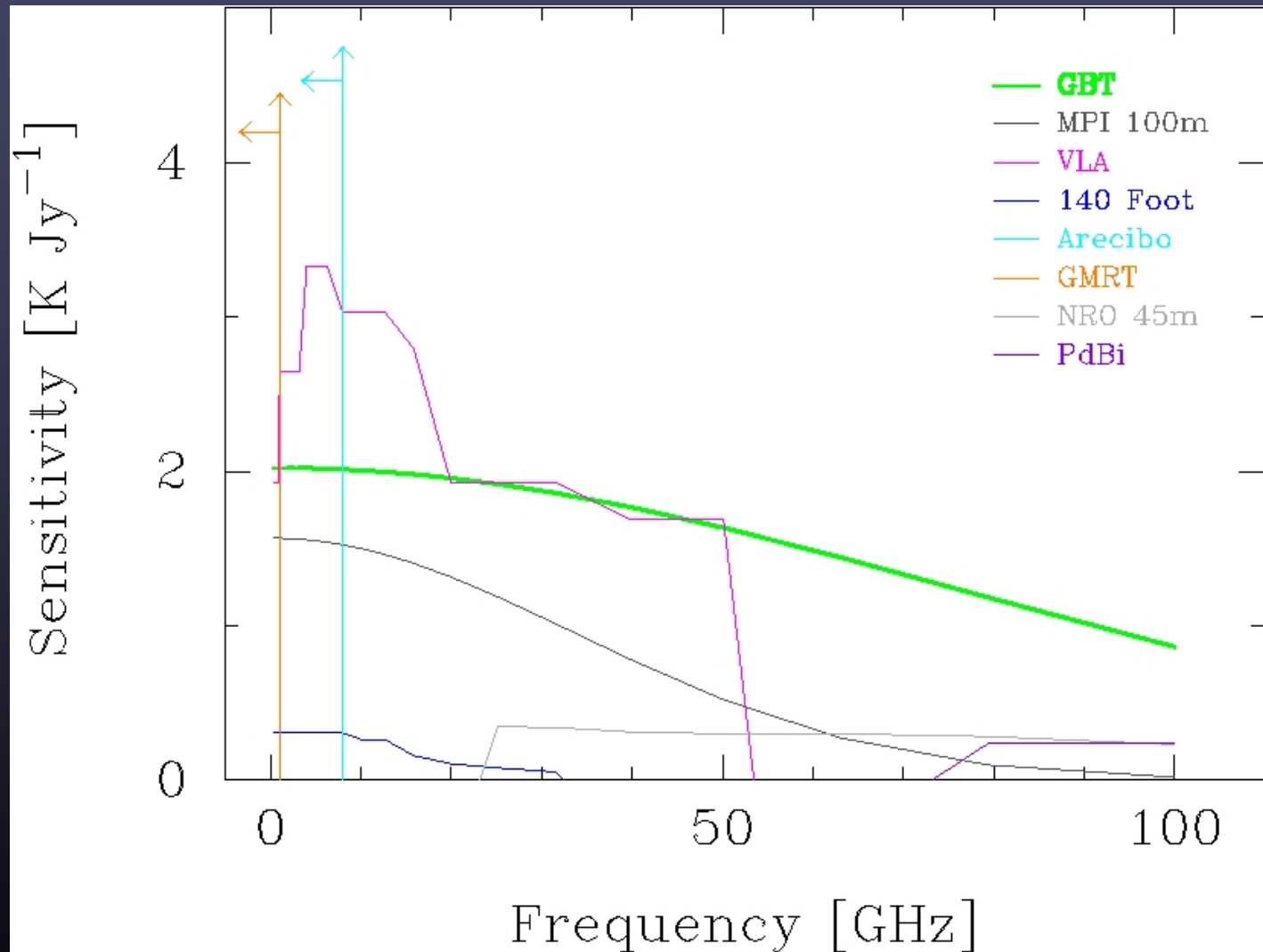
Unblocked Aperture



Active Surface



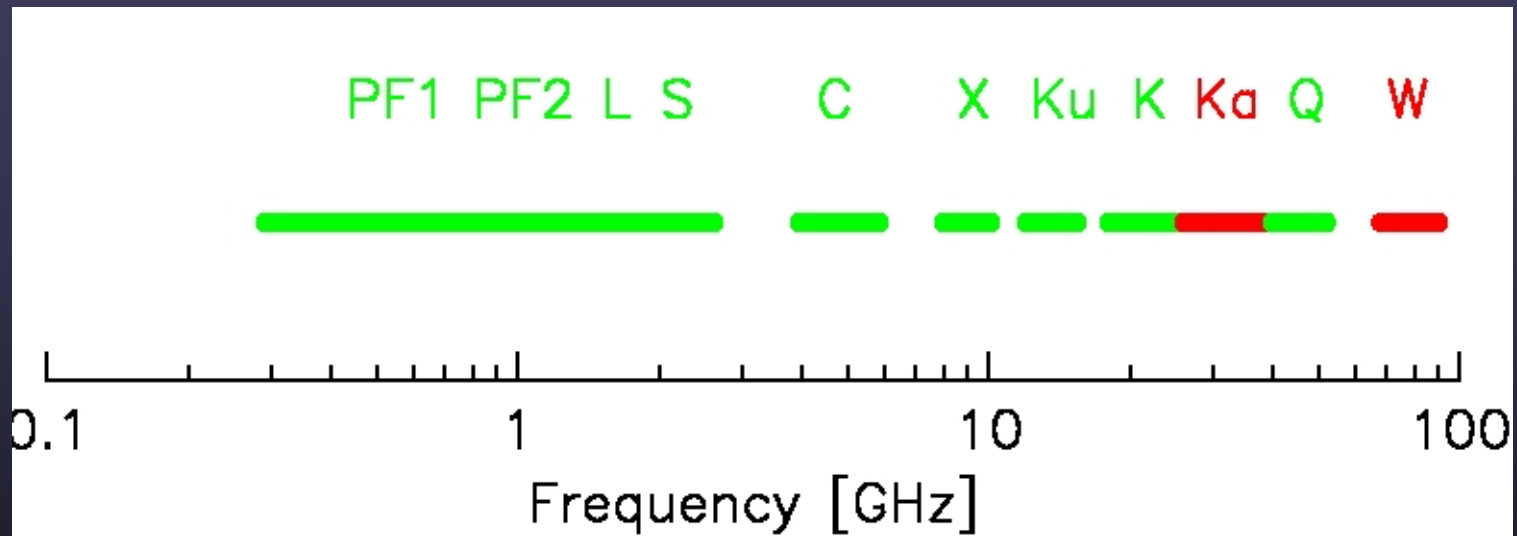
GBT Sensitivity



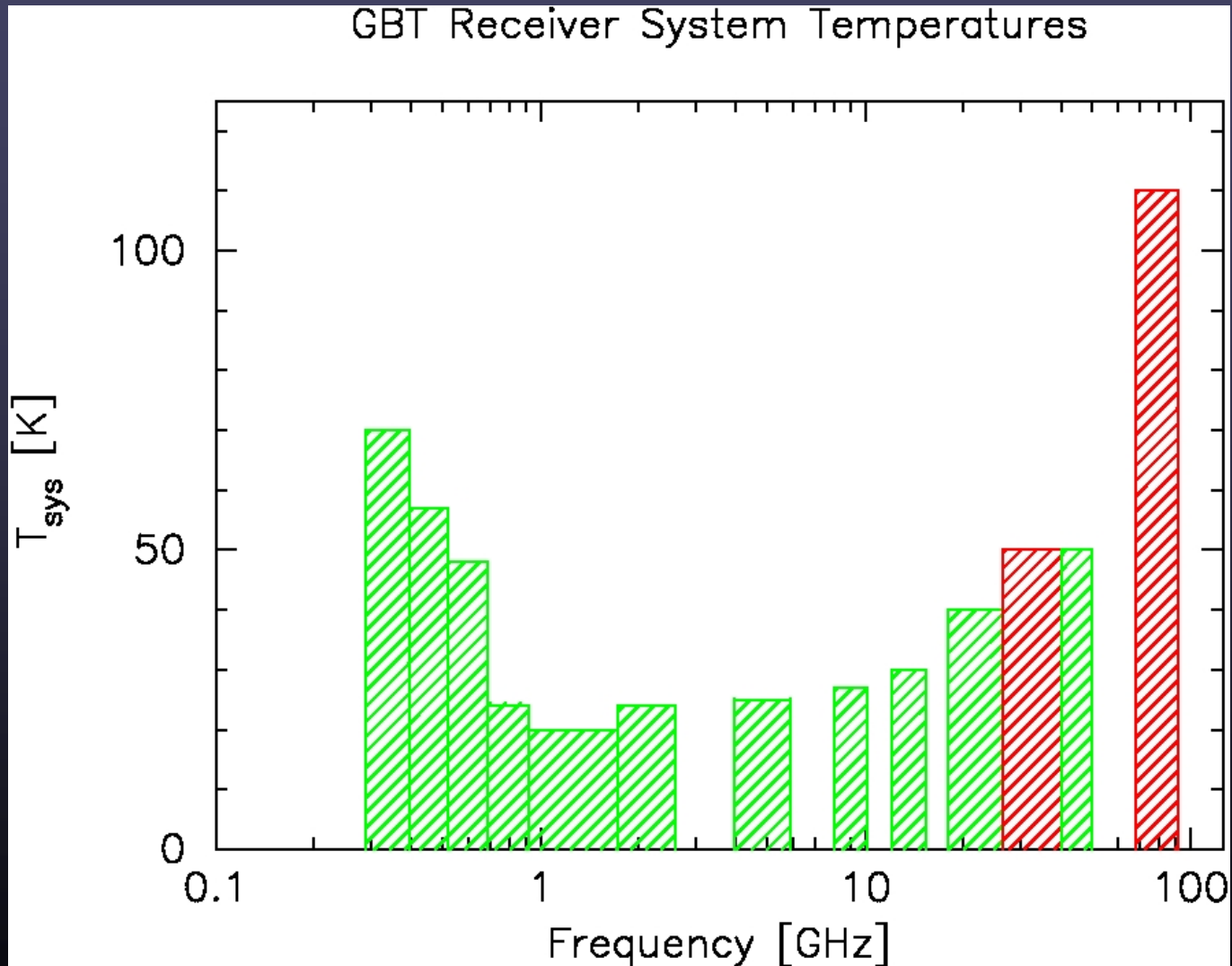
Telescope Optics



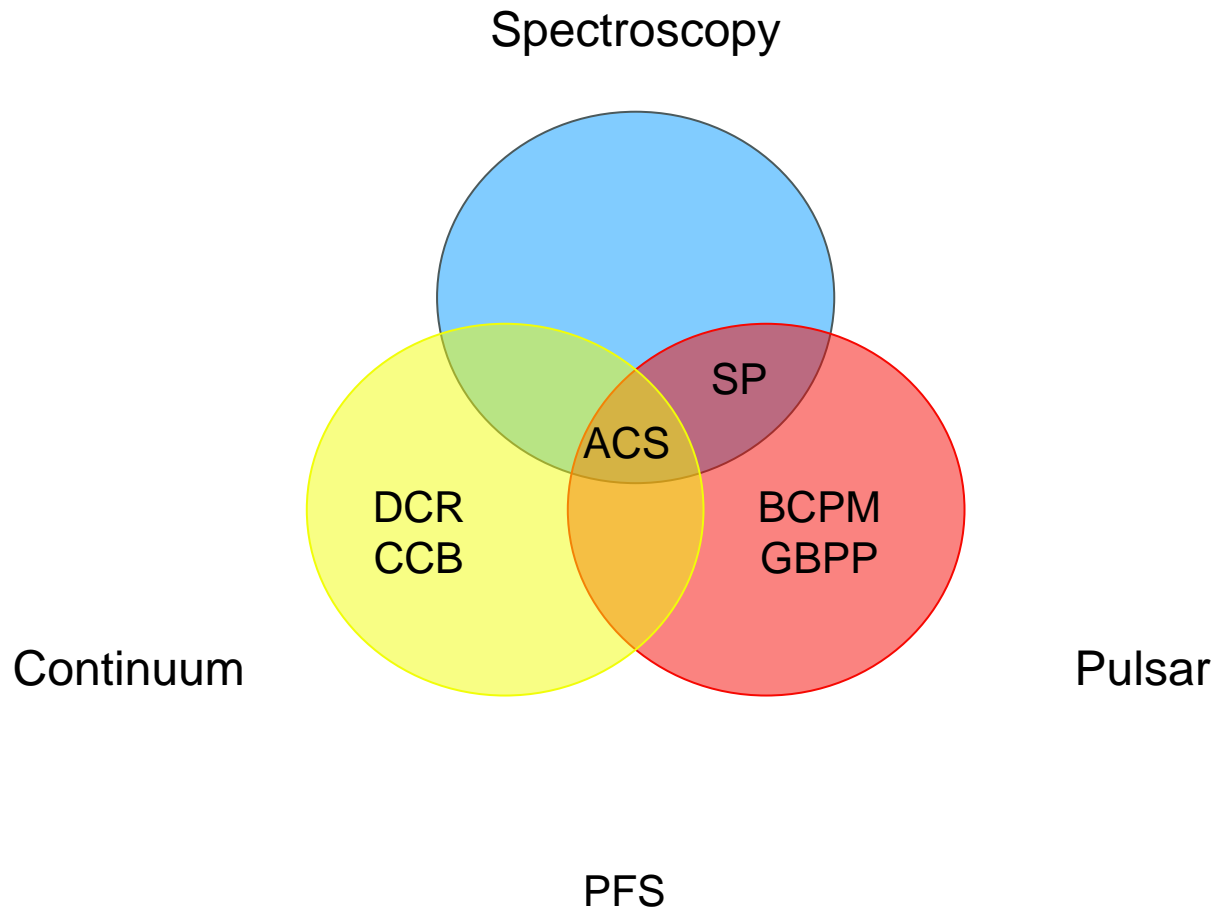
Front-end Status



GBT Receiver System Temperatures



Back-end Status





Current Pointing Performance

Benign Conditions: (1) Exclude 10:00 → 18:00
(2) Wind < 2.5 m/s

Blind Pointing:
(1 point/focus)

$$\sigma_2 \approx 5 \text{ arc sec}$$
$$\sigma(\text{focus}) \approx 2.5 \text{ mm}$$

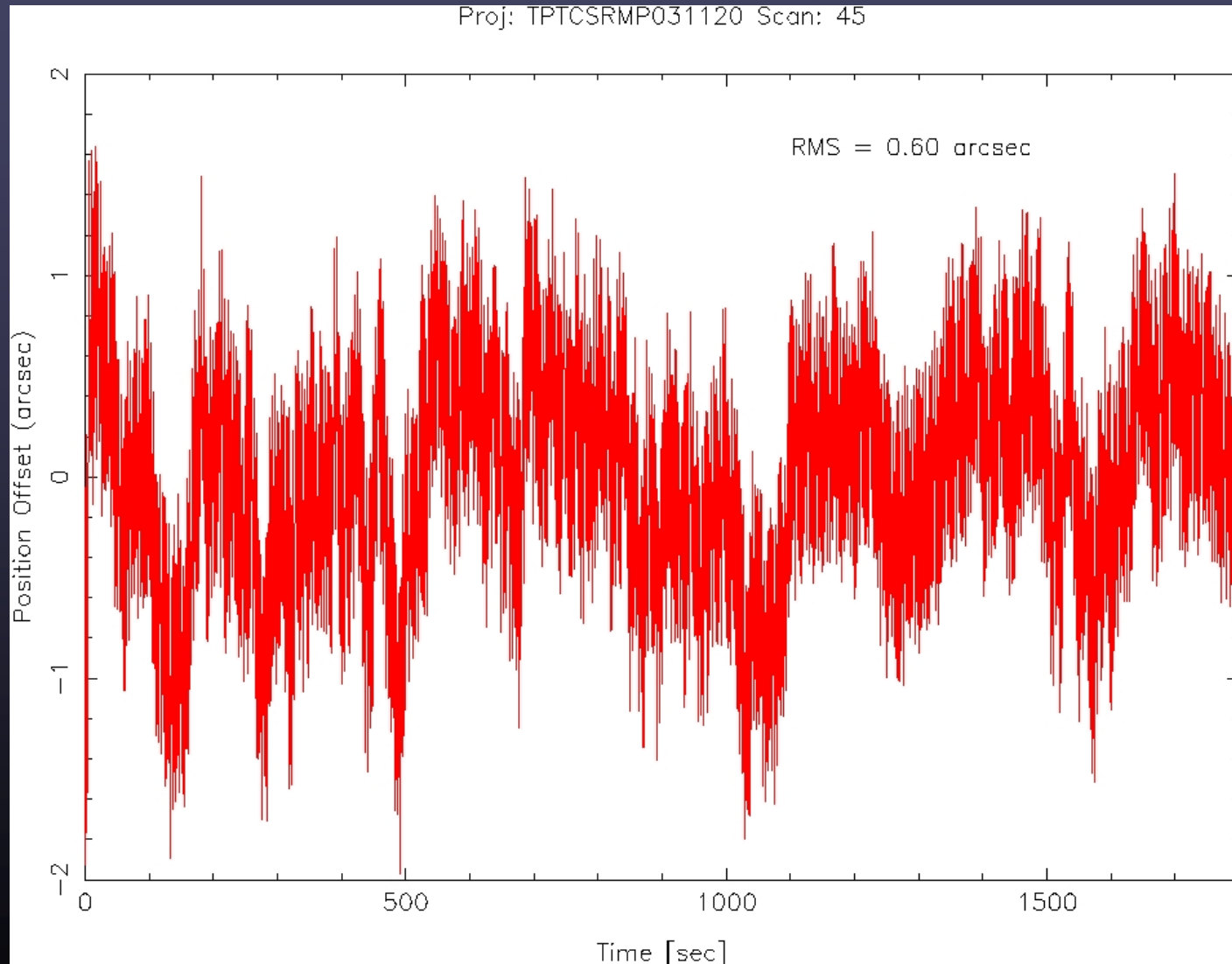
Offset Pointing:
(90 min)

$$\sigma_2 \approx 2.7 \text{ arc sec}$$
$$\sigma(\text{focus}) \approx 1.5 \text{ mm}$$

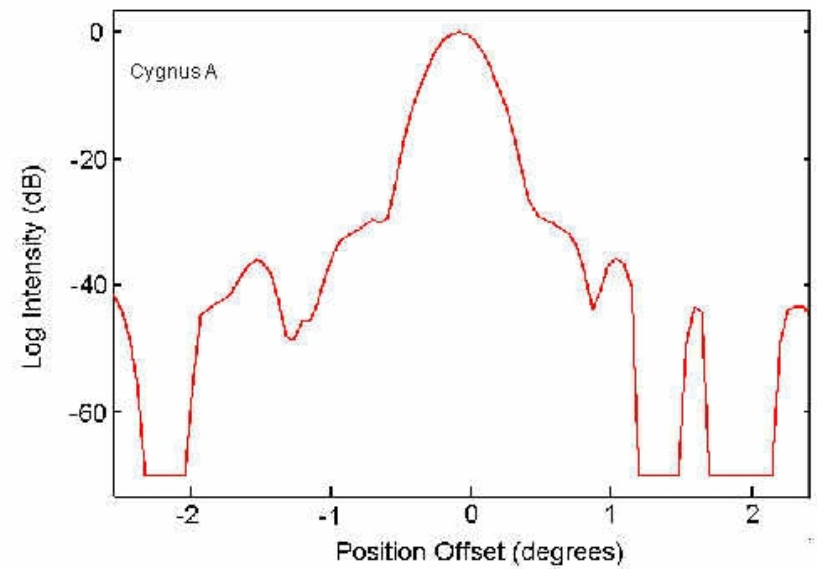
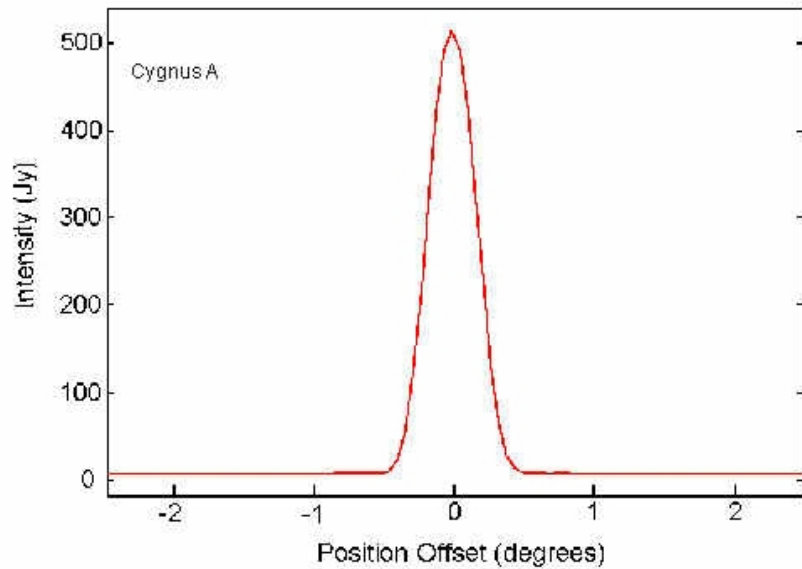
Continuous Tracking:
(30 min)

$$\sigma_2 \approx 1 \text{ arc sec}$$

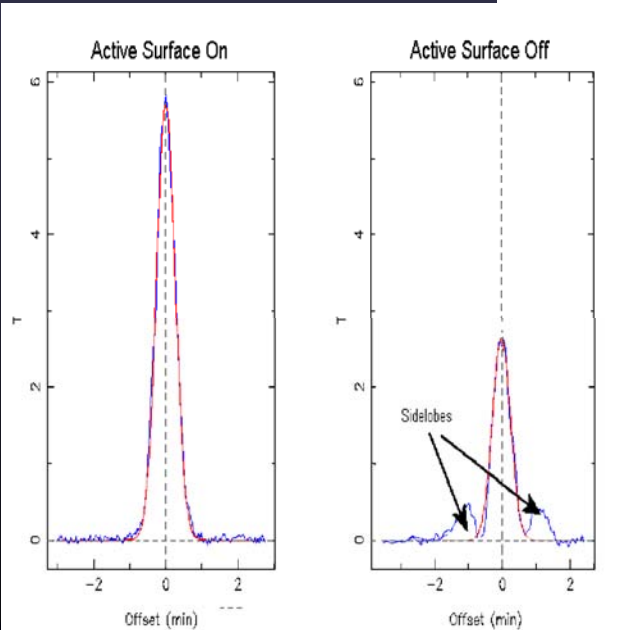
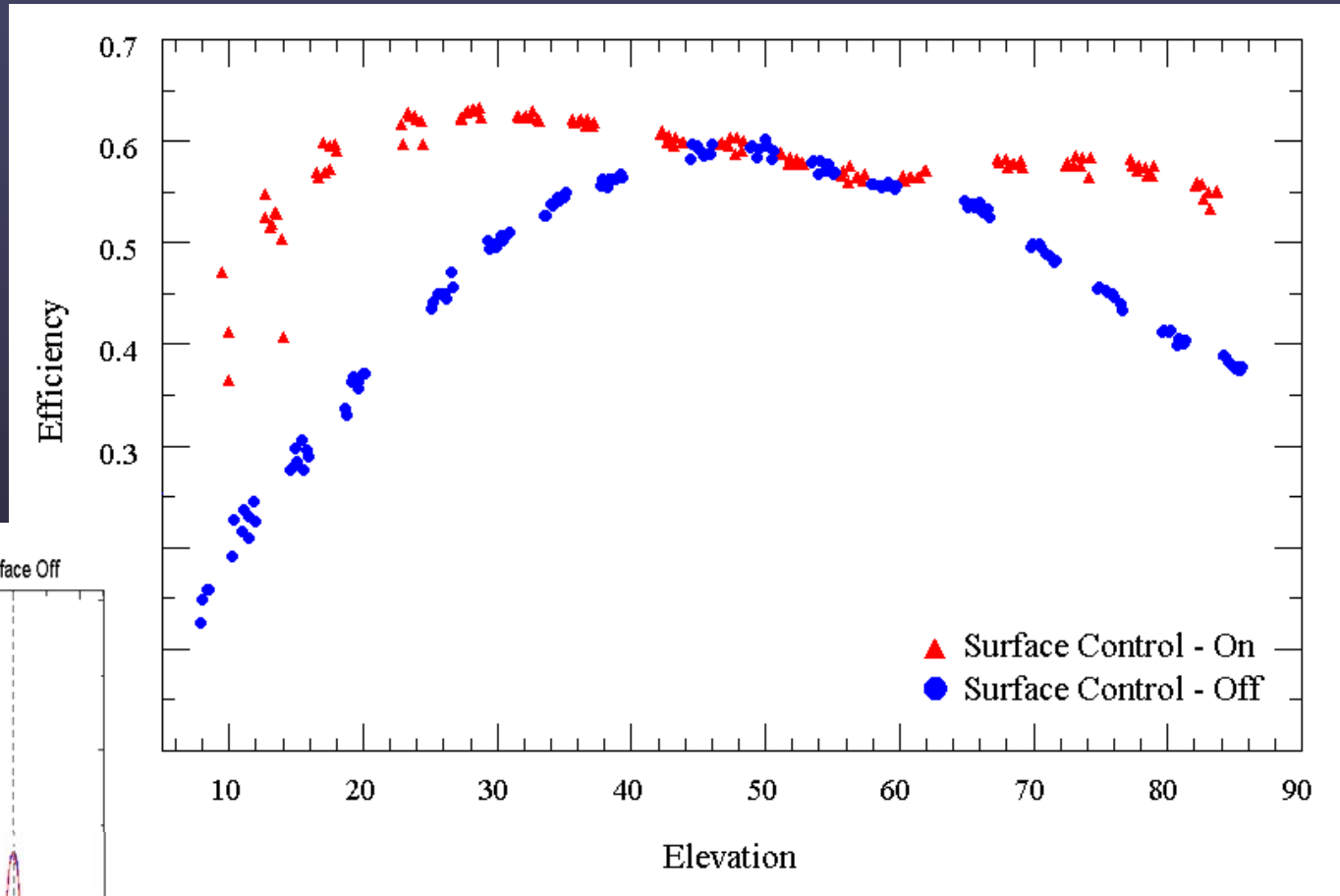
Half-power Track (14 GHz)



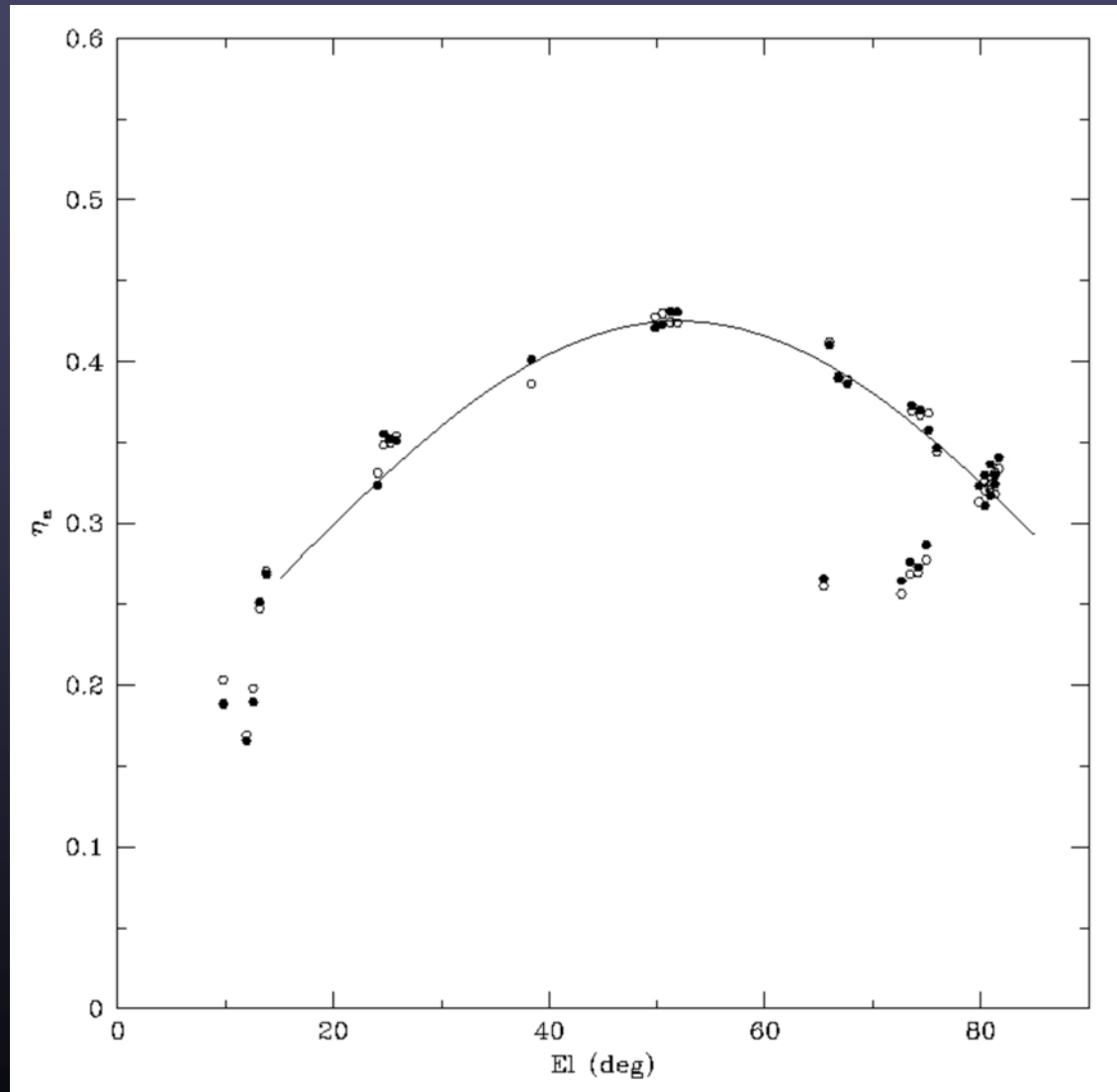
GBT Sidelobes (Cygnus A @ 800 MHz)



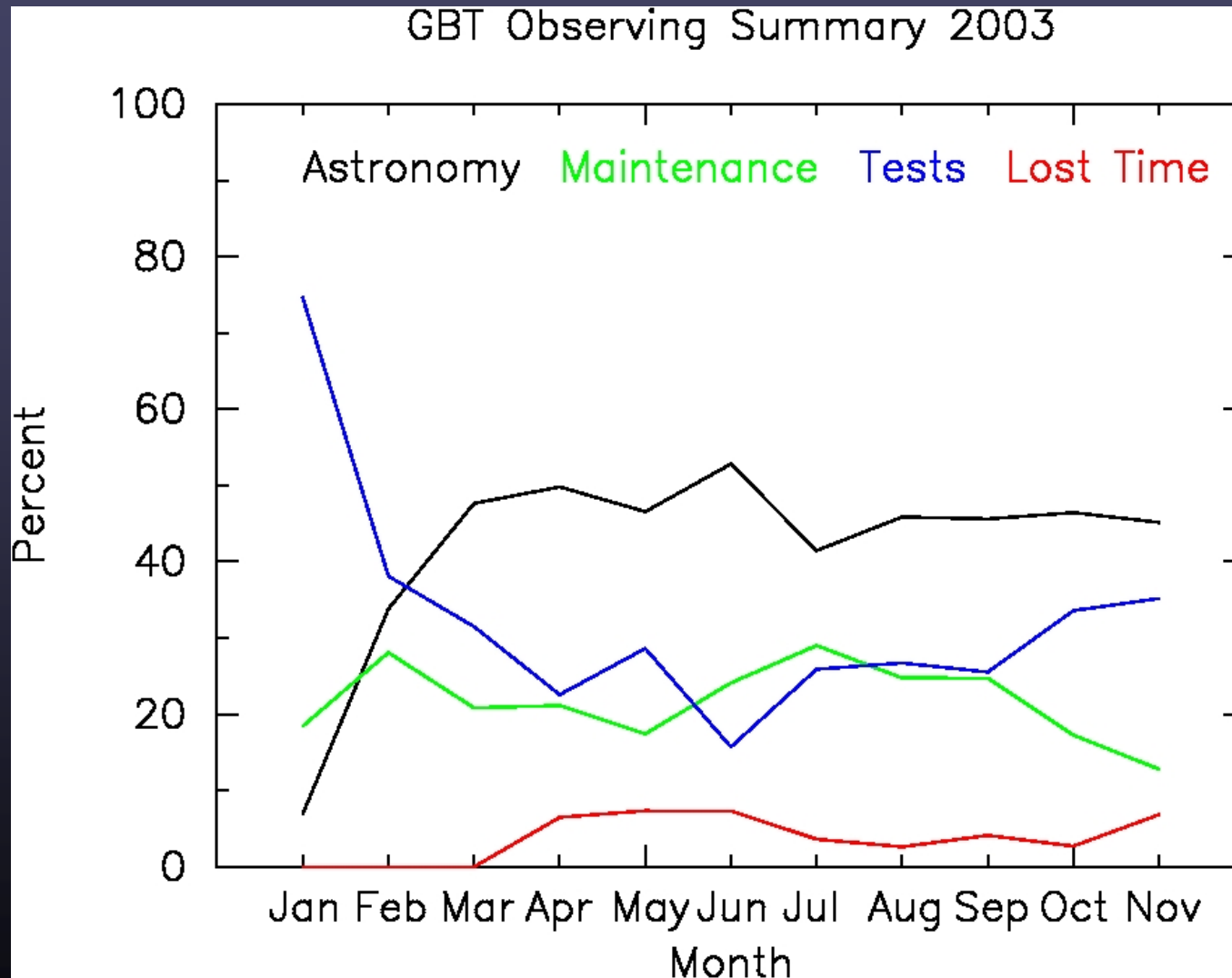
Active Surface Performance at 20 GHz



Q band (43 GHz) Performance



GBT Observing Summary (2003)

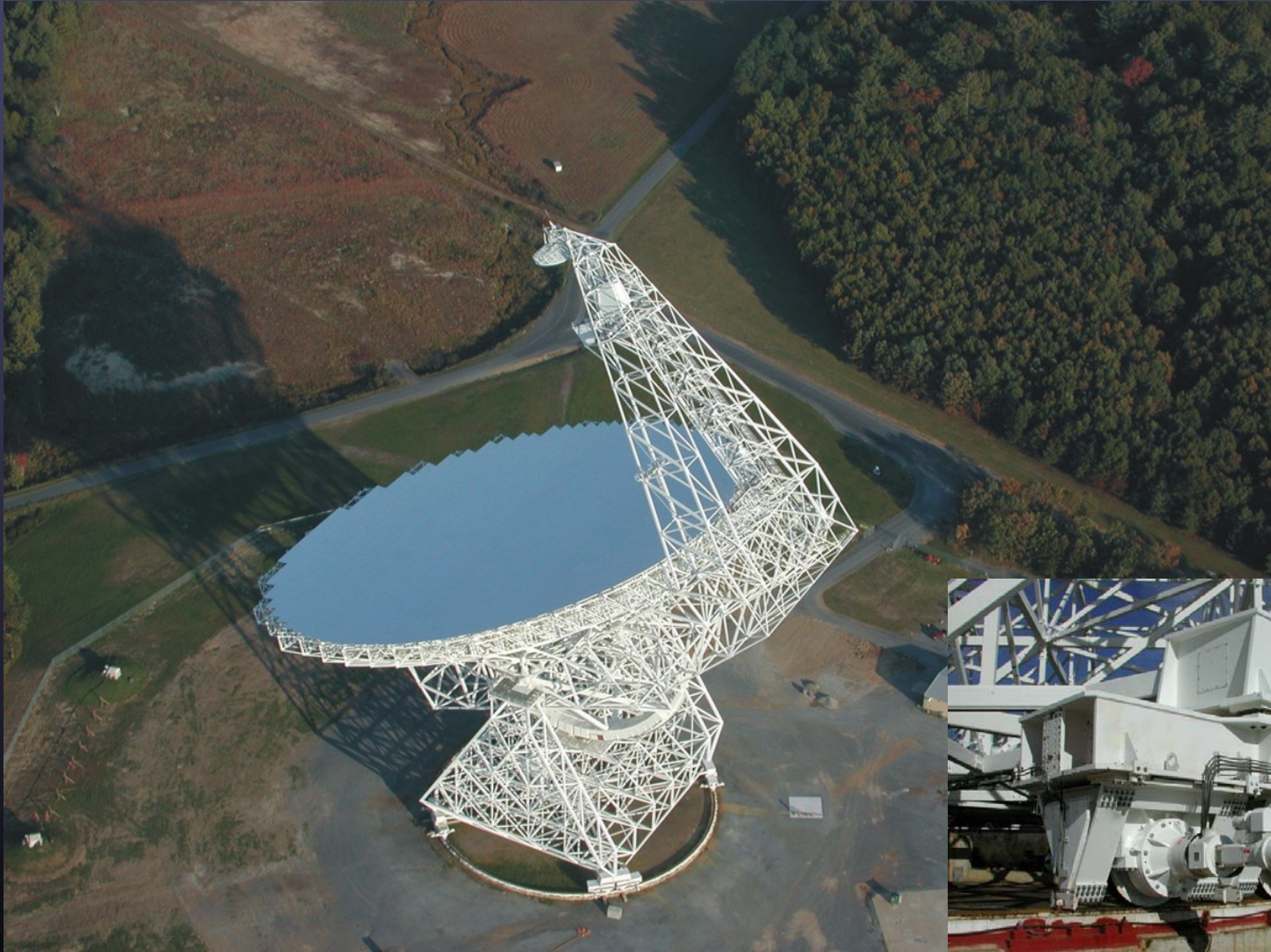




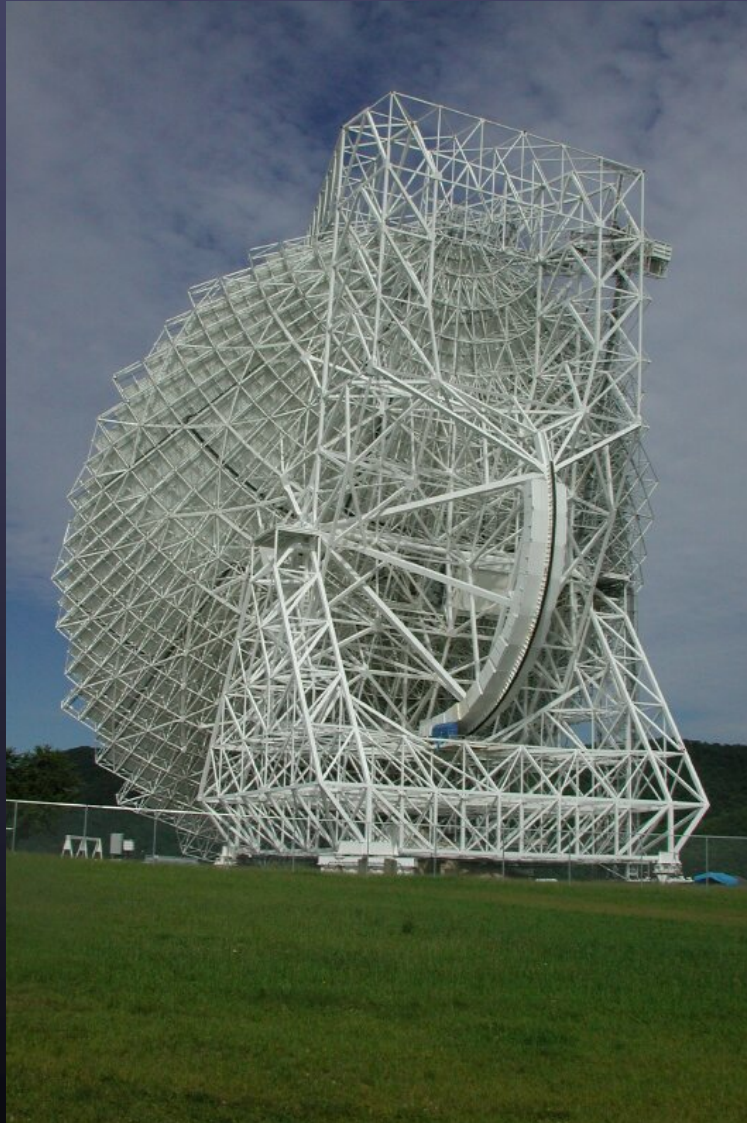
Supplemental Material



Azimuth (40 degrees per minute)



Elevation (20 degrees per minute)





Front-end Status

Receiver	Operating Range	Status
Prime Focus 1	290—920 MHz	Commissioned
Prime Focus 2	910—1230 MHz	Commissioned
L Band	1.15—1.73 MHz	Commissioned
S Band	1.73—2.60 MHz	Commissioned
C Band	3.95—5.85 MHz	Commissioned
X Band	8.2—10.0 MHz	Commissioned
Ku Band	12.4—15.4 MHz	Commissioned
K Band	18—26.5 MHz	Commissioned
Ka Band	26—40 MHz	Under Construction
Q Band	40—50 MHz	Partially Commissioned
W Band	68—92 MHz	On Hold
Penn Array	86---94 MHz	Under Construction



Back-end Status: Spectroscopy

GBT Spectrometer (3 and 9-level correlator):

Bandwidths: 12.5, 50, 200, 800 MHz

Modes: 8 x 800 MHz; 32 x 50 MHz

Resolution: 48 Hz @ 12.5 MHz

Spectral Processor (32 bit FT spectrometer):

Bandwidths: 0.078125 – 40 MHz

Modes: 2 x 1024 x 40 MHz; 8 x 256 x 10 MHz

Resolution: 76.3 Hz @ 0.078125 MHz



Back-end Status: Continuum

Digital Continuum Receiver:

- V/F converter into 28 bit counters
- 16 inputs; 10 switching phases
- 100 nano-sec phase time resolution

Caltech Continuum Back-end: (under construction)

- For Ka and W-band receivers
- Full bandwidth
- 10 kHz switching



Back-end Status: Pulsar

Spectrometer:

Bandwidth: 800 MHz

Data rate: 25 MB per second

Spectral Processor:

Bandwidth: 40 MHz

Pulsar timing

Berkeley Caltech Pulsar Machine (BCPM1, BCPM2):

Bandwidth: 23 – 160 MHz

Green Bank-Berkeley Pulsar Processor (GBPP):

Digital de-dispersion; cross pol

Back-end Status: Misc



Portable Fast Sampler: bi-static radar
Sample Rate: 20 MHz



GBT Sensitivity (60 second integration time)

Spectral Line Sensitivity	Bandwidth	RMS Noise
1420 MHz (HI)	1 km/s	0.06 K (32 mJy)
22 GHz (H ₂ O)	1 km/s	0.03 K (18 mJy)
43 GHz (SiO)	1 km/s	0.03 K (15 mJy)
89 GHz (HCN)	1 km/s	0.04 K (40 mJy)
Continuum Sensitivity		
14 GHz	3 GHz	55 micro-Jy
90 GHz	7 GHz	270 micro-Jy
90 GHz	20 GHz	120 micro-Jy