Noise Updates

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Karl Young, Shaul Hanany, Qi Wen, Xin Zhi Tan

Summary

- Partial list of current optics, loading, and sensitivity assumptions
- Adding curved focal plane
  - Same size mirrors
  - Larger mirrors
- CMB map depth values for emissivity, mirror, stop temperature cases presented last week.

Assumptions

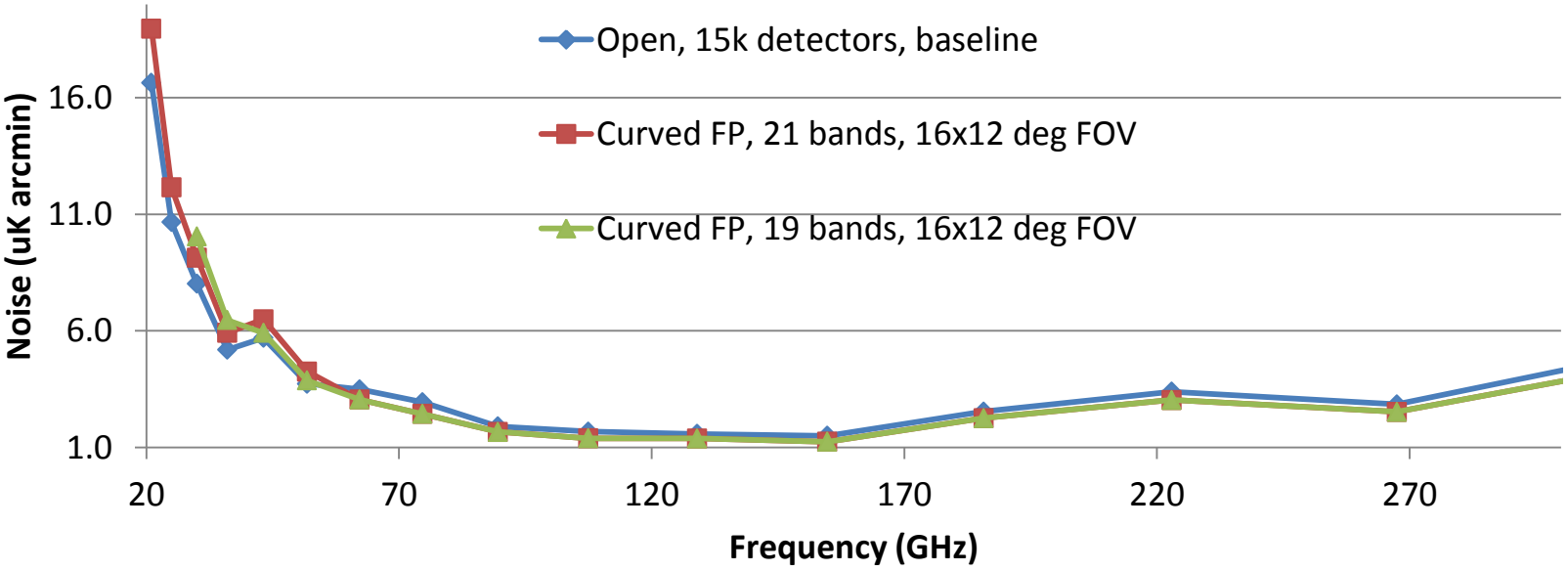
- Partial list! I will write a full list into a memo and post to the wiki.

- 4 year mission
- 100% observing efficiency
  - Should we use 90%? 95%
- Temperatures: 30 K primary, 4 K secondary, 4 K stop, 100 mk focal plane
- Mirror emissivity 1 % (action to change this to 0.07 % as discussed Nov. 21)
- Edge taper 10 dB at middle band of pixel

- On next slides I'm comparing to the 15,030 detector Open Dragone with total CMB sensitivity of 0.67 uK arcmin. NOT version 2.7 which was posted on the wiki
  - This isn't quite fair and I will compare with 2.7 in the future.
  - Scalings should be the same.

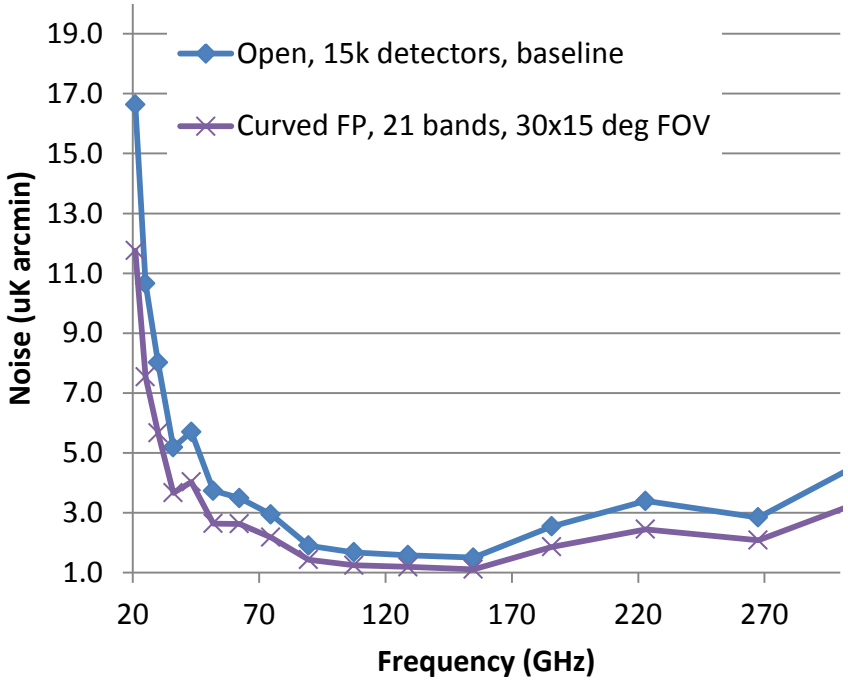
Curved focal plane

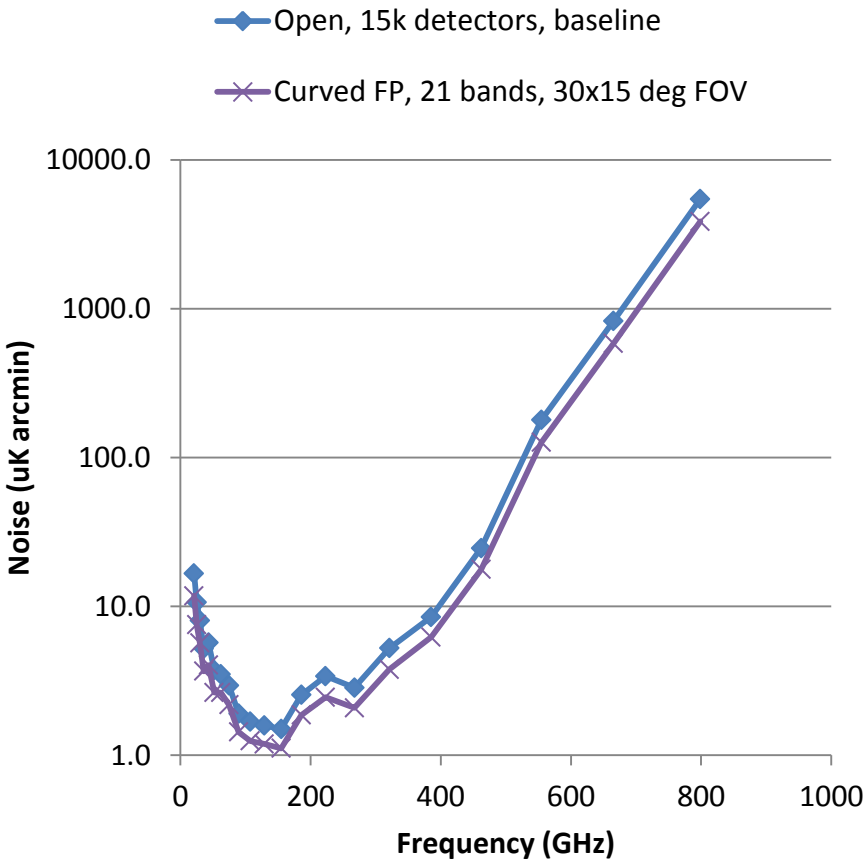
- DLFOV is larger at all frequencies, allows more pixels at CMB frequencies.
- Focal plane still limited to 16 x 12 deg, 55 x 47 cm.
  - Comparing to 15030 bolos and 0.67 uK arcmin.
  - Same 21 bands as past.
    - # of pixels below 55 GHz is reduced, pixels added at CMB frequencies
    - 18,960 bolos, 0.58 uK arcmin
  - With 19 bands, no 20 or 25 GHz band.
    - # of pixels unchanged below 55 GHz.
    - Smaller low frequency pixels allow CMB pixels to be added.
    - 18,840 bolos, 0.58 uK arcmin



Curved focal plane

- Focal plane out to 30 x 15 deg, 106 x 53 cm.
  - Mirrors larger, see next page.
  - 21 bands,
    - Larger focal plane, so # pixels roughly doubles from 15,030 to 28,020
    - Sensitivity from 0.67 to 0.49 uK arcmin

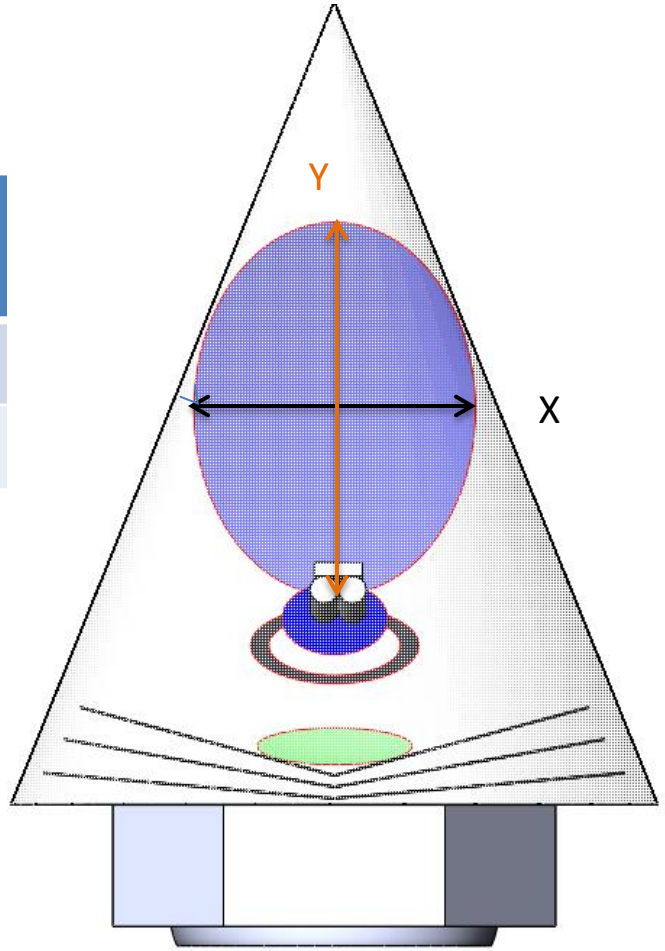


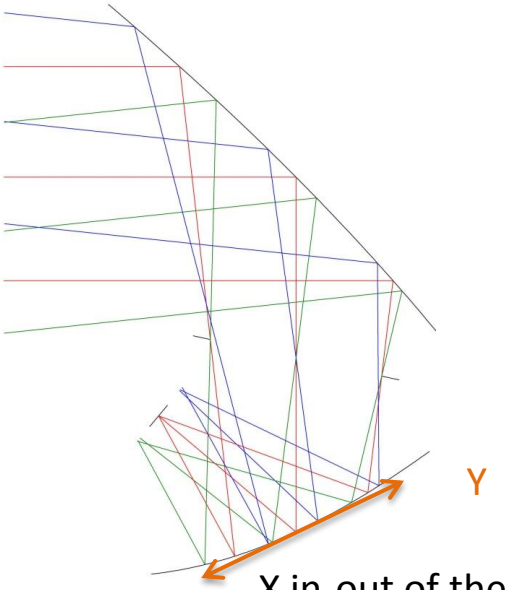


Larger mirrors

- Focal plane out to 30 x 15 deg, 106 x 53 cm.
  - Will no longer fit in current shields with alpha = 22 deg
  - Mirror sizes below. X, Y is in the plane of each mirror.

Mirror	Old size (cm)	New size (cm)	Change in X,Y (cm / deg)
Primary	200 x 270	250 x 285	3.6, 5
Secondary	132 x 133	168 x 141	2.6 x 2.7





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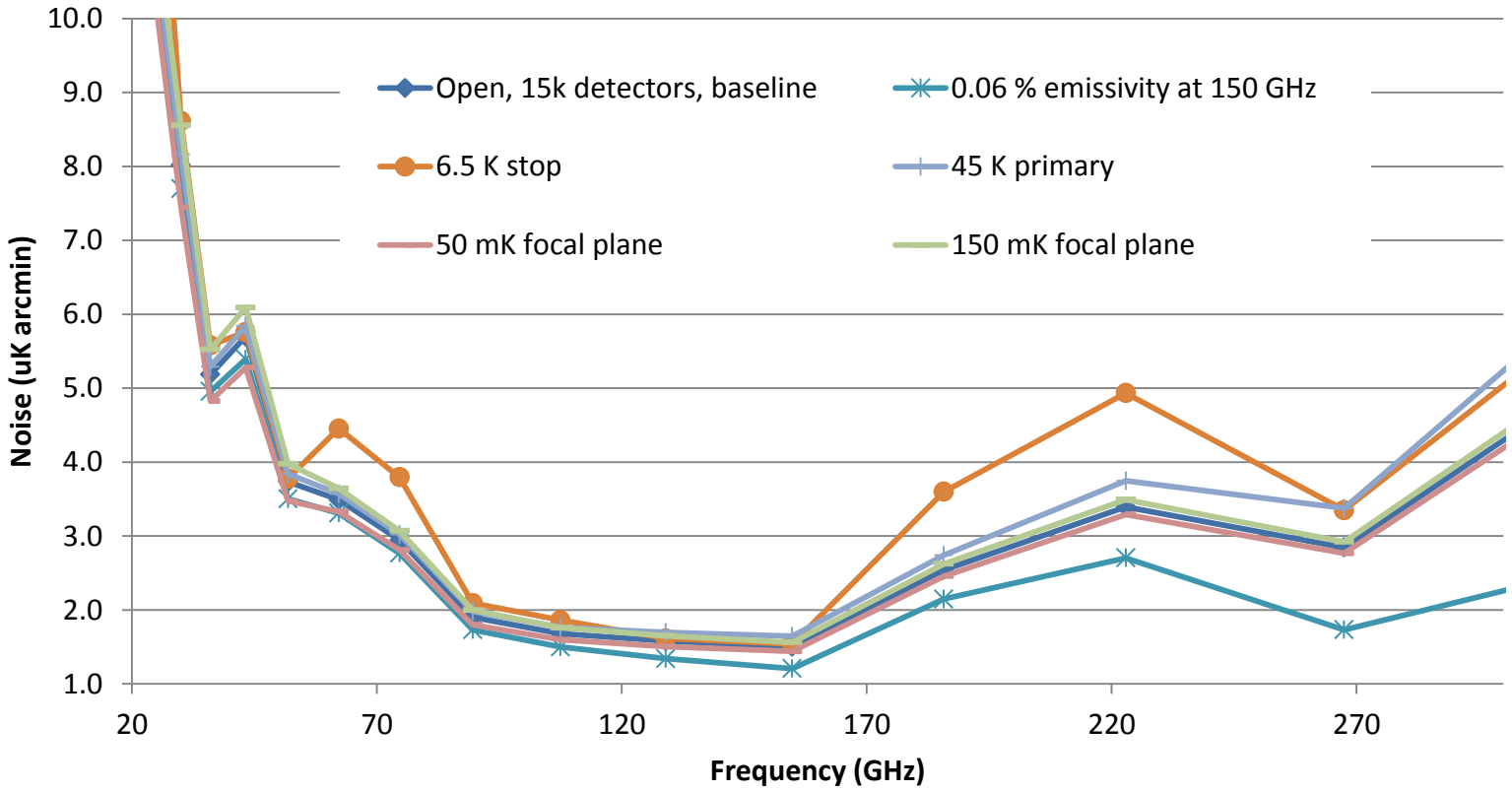
Temperature and emissivity

- The cases discussed last week.
- Log plot on next page.

Case	CMB map depth (uK arcmin)	Ratio, row / baseline
Baseline	0.67	--
0.06 % emissivity	0.54	0.81
6.5 K stop	0.74	1.11
45 K primary	0.71	1.07
50 mK focal plane	0.64	0.95
150 mK focal plane	0.69	1.04



Temperature and emissivity