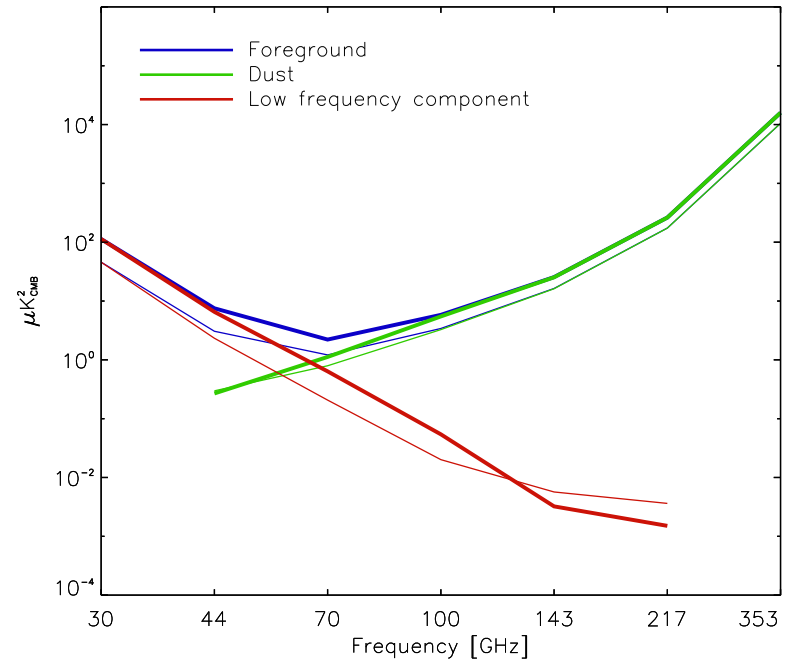


Detectors and Frequencies

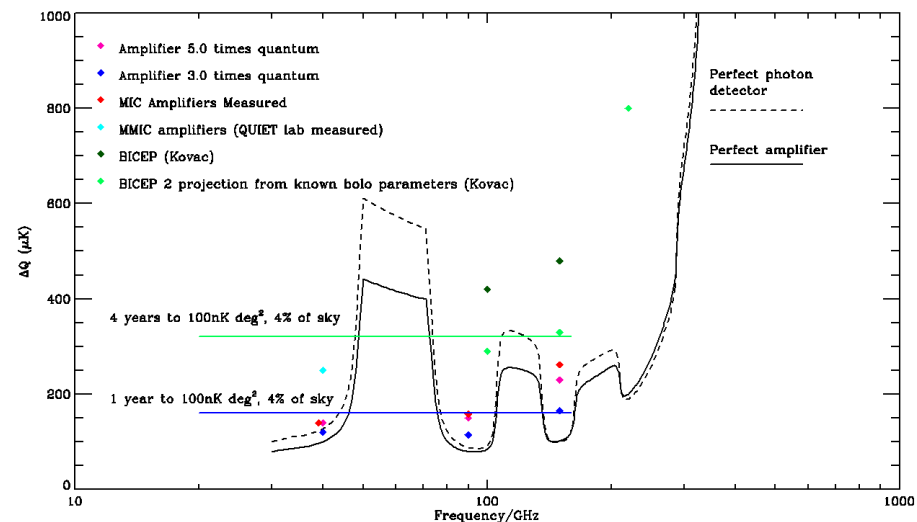
- Sensitivity is important, but for the polarized CMB foregrounds and systematics are more important. And harder!
- Large ℓ range \rightarrow large f_{sky} \rightarrow no escape from foregrounds
- Foreground minimum is at 70 GHz. Not 70–100 GHz, not 140 GHz. Must measure both low- and high-frequency foregrounds.
- Certainly below the oxygen anti-window amplifiers are easier to build and perform better than bolometers.

Electronic modulation; Q and U simultaneously; 20-K cooling; etc.

- Build amplifiers at low frequencies, bolos/MKIDs at high. **Overlap at 100 GHz.**
- Build on separate “large” and “small” telescopes to give same beam size range. No “mixed” focal planes.



Polarized foregrounds. Thick — EE ; thin — BB . $f_{\text{sky}} = 71\%$.



Church 2008. Assume 512 feeds/planar antennas at each frequency; 8 K loading from telescope, high dry site.