

Discussion of 'baseline' necessary for TD

[Baseline tab of S4 TD spreadsheet](#)

Baseline & assumptions

From CDT: CMB-S4 can be developed based on existing technology

Baseline tab of S4 TD spreadsheet

- Right now: TES/68x FDM/feedhorns
 - Separate splits for lenslets, planar antenna arrays, ... other? Discuss.

Maximum achievable pixel densities using existing technology:

*Ignoring readout constraints

- Optics constraints
 - Maximum density of feedhorns

○ Lenslets:

6.8 mm/pixel demonstrated at 90GHz - pushing now towards 5.3 & 5.8mm.
From A. Cukierman

Frequency	Minimum pixel diameter*
LF	13.4mm
MF	5.3mm
HF	3.2mm
UHF	2.0mm

From S. Simon

- No CDT assumption on xpol, beam systematics. How do feedhorns/lenslets/planar antenna arrays compare (as a function of frequency)?

Maximum achievable pixel densities using existing technology:

- Optics constraints - maximum usable focal plane area
 - **BICEP (from Z.A.)**
 - 550mm aperture for B3, 460mm usable focal plane diameter (20x 3" square tiles)
 - BICEP Array will hold 4x B3-class receivers
 - **CCAT-p (from M.D.N.)**
 - 7 optics tubes, each with 3 hexagonal 150mm arrays

Maximum achievable pixel densities using existing technology:

- Readout constraints
 - **FDM**
 - For SPT3G w/ 68x MUX factor, 30 LC boards behind each 150mm wafer = 2040 detectors.
 - Not using all of the warm electronics BW; 128x MUX factor should be achievable = 3840 detectors.

Any technologies that need to be developed to aid in testing? Discuss.

Steve Padin : *CDT cost estimate included something like 10M for test setups, but this is all included in the construction costs, not the pre-project technology development*

Discuss goals for Nov
30 combined telecon