

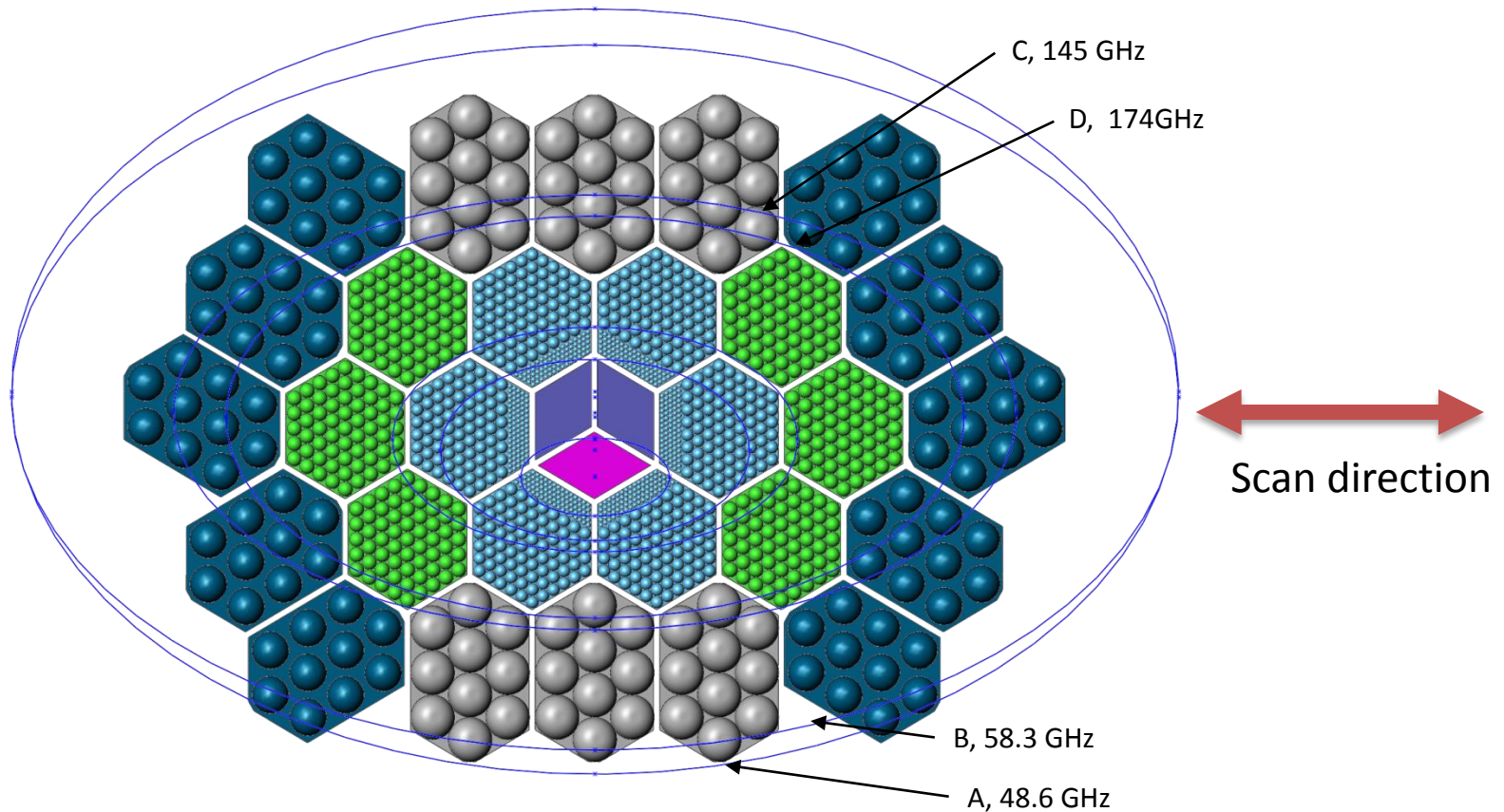
Focal Plane Status

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Focal Plane V5

- Central wafer split, due to different technology types
 - Fewer F pixels, more G,H,I pixels
- Central wafer split by technology type
- 4 mm spaces between wafers (EBEX was 4.2 mm, Polarbear similar, BICEP 5.5 mm)
- approximately 19 x 12 deg, 65 x 45 cm.



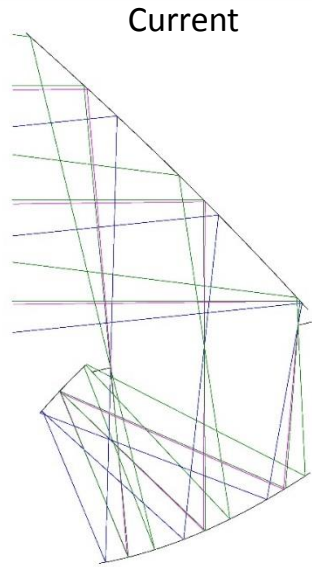
- Still to do:
 - Investigating if more pixels can be added.

Focal Plane V5

- Do we need to adjust pixel positions for optimal scan patterns?
- Wire bonding or bump bonding chips on focal plane?
 - Wire bonds have heritage and allow more flexibility.
 - Limited to 1400 detectors per wafer 1700 detectors per hex wafer (bond pitch = 80 um)
 - Bump bonds allow more density of connections per chip.
 - If KIDs (or similar) are dominate tech in 5 years this point is moot.
- Volume needed for 100 mK readout components? 4K readout components?
 - 100 mK TDM requires 4 mm² per channel (Hannes)
 - 100 mK FDM requires LCs, about 50-80 mm² channel (from EBEX-IDS, LCs on silicon wafer)
 - 4K, both need SQUIDs

Pixel	Bands (GHz)	Upper edge of upper band (GHz)	V4 Number	V5 Number	Bolometers per wafer	Area behind 1 wafer (mm ²)	Area needed for TDM chips (mm ²)
A	21, 30, 43	48.6	60	60	60	8100	240
B	25, 36, 52	58.3	100	100	60	8100	240
C	62, 90, 129	145	366	366	366	5700	1500
D	75, 108, 155	174	510	510	990	5700	3960
E	186, 268, 385	433	480	480			
F	223, 321, 462	520	550	450	1350	1730	5400
G	555	624	200	220	1000	1730	4000
H	666	749	160	200			
I	799	899	120	180			

Mirror limits to focal plane size



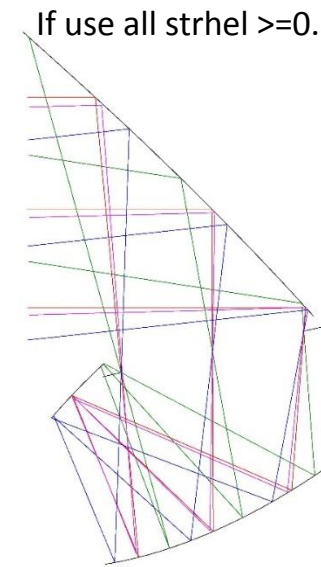
Current

62.50 CM

best_zrn.len

Scale: 0.04

07-Feb-18



If use all strhel ≥ 0.8

64.10 CM

best_zrn.len

Scale: 0.04

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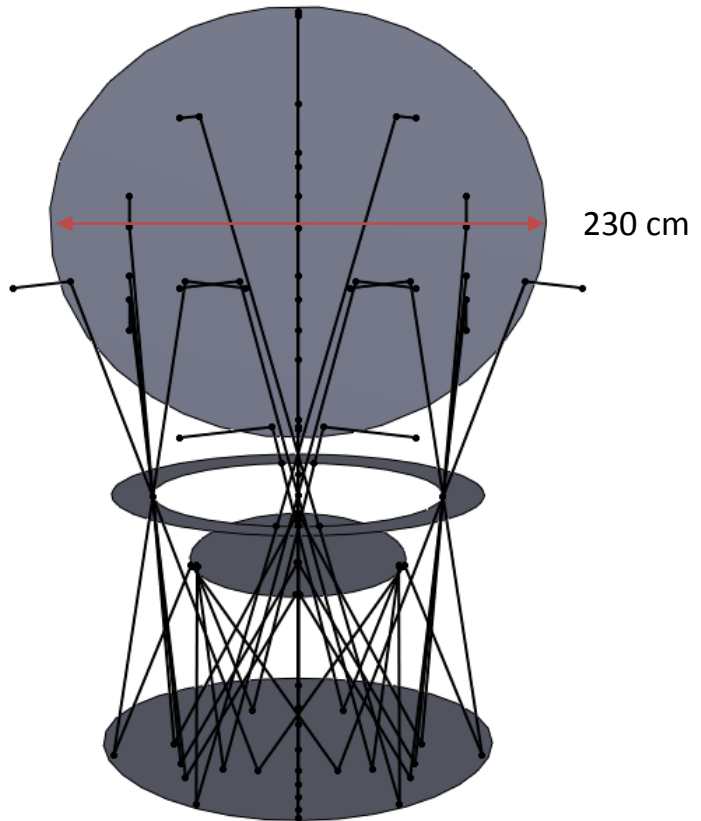
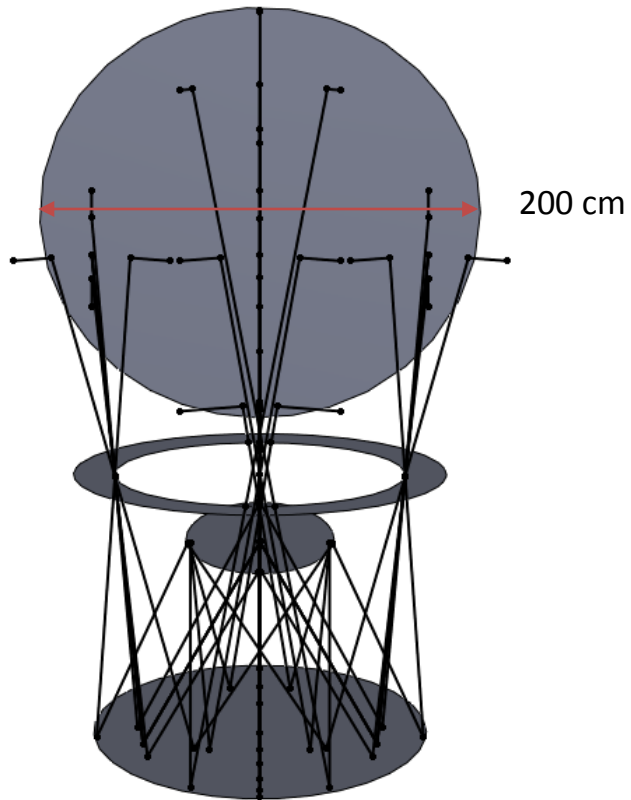
FOV	cm	deg
X	32.25	8.8
-X	-32.25	-8.8
Y	18.85	5.7
-Y	-25.65	7.0

X: in & out
Y: on the page

FOV	cm	deg
X	46.9	12.9
-X	-46.9	-12.9
Y	20	6.1
-Y	-31.8	-8.6

Clearance to stop = 8.5 cm

Clearance to stop = 0 cm; as we go to -Y, clearance smaller



	Current	If use all Strehl ≥ 0.8
Primary Mirror	270 cm X 200 cm	285 cm X 230 cm
Secondary Mirror	152 cm X 158 cm	178 cm X 168 cm
Focal Plane	65 cm X 45 cm	100 cm X 54 cm