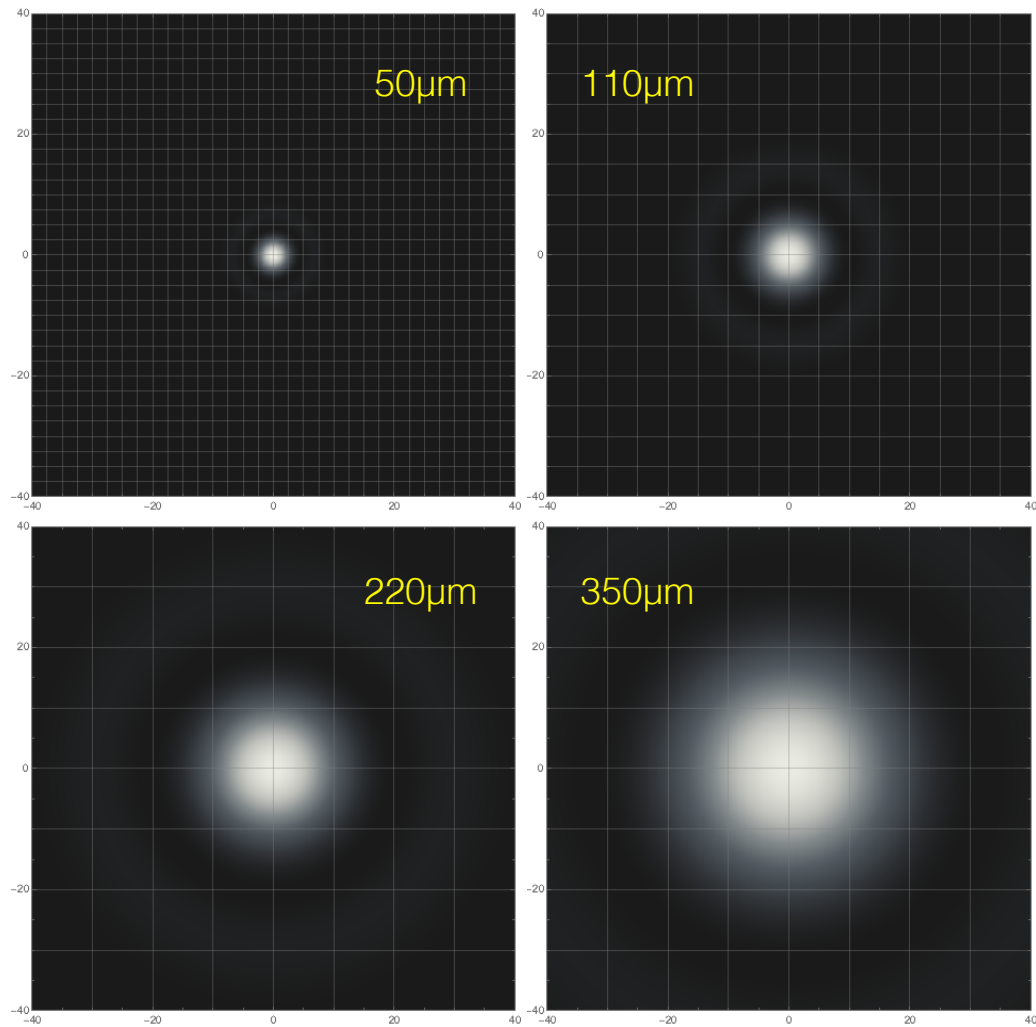


BiBoP for SPICA

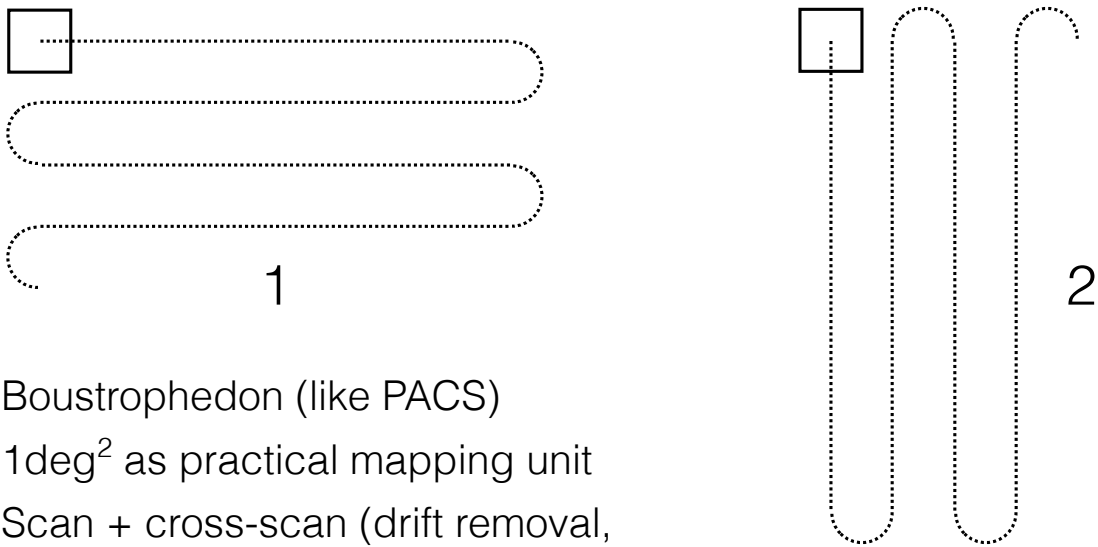
- Broad-band FIR imager/polarimeter
- 4 wavelength bands:
 - 50 μm (40 — 60 μm , unpolarised)
 - 110 μm (85 — 135 μm , dual polarisation)
 - 220 μm (170—270 μm , dual polarisation)
 - 350 μm (280—420 μm , dual polarisation)
- ~100 times better sensitivity than Herschel
- Si bolometers with very low dissipation at cryogenic temperature levels and large dynamic signal range

BiBoP Focal Plane Footprint

- 80"x80" FOV per band
- Pixel sizes
 - ~~2.5"x2.5" (50 μ m)~~
 - 5"x5" (110 μ m)
 - 10"x10" (220 μ m)
 - 10"x10" (350 μ m)
- Telescope PSF at band centres



Baseline Mapping Mode



- Boustrophedon (like PACS)
- 1deg^2 as practical mapping unit
- Scan + cross-scan (drift removal, Scanamorphos, Unimap)
- Scan speed $10''/\text{s}$ @ $50\mu\text{m}$ (scaled from PACS $70\mu\text{m}$)
 - $1\text{deg}/6\text{min} \rightarrow 1\text{deg}^2$ (45 turns) in 4.5h (9h with cross scan)
 - with some overhead for turns we assume 10h for 9h exposure
- Scan speed $20''/\text{s}$ for polarised bands $\rightarrow 5\text{h}/4.5\text{h}$ per deg^2
 - wave plate rotation will make this 10h/9h per deg^2 , too
 - scan speed up to $60''/\text{s}$ possible, with little compromise on $110\mu\text{m}$ PSF

Summary of BiBoP Specs (Requirement)

	50μm	110 μ m	220 μ m	350 μ m
Band edges	40—60μm	85—135 μ m	170—270 μ m	280—420 μ m
# of pixels	32 x 32	16 x 16 (x 2)	8 x 8 (x 2)	8 x 8 (x 2)
Pixel size	2.5" x 2.5"	5" x 5"	10" x 10"	10" x 10"
PS sensitivity 5 σ /1h/FOV (unpolarised)	9.5μJy	28 μ Jy	56 μ Jy	190 μ Jy
PS sensitivity in Stokes (Q,U) 5 σ /1h/FOV (polarised)	—	40 μ Jy	79 μ Jy	270 μ Jy
PS sensitivity 5 σ /10h/1deg ² (unpolarised)	0.14 mJy	0.42 mJy	0.84 mJy	2.9 mJy
PS sensitivity in Stokes (Q,U) 5 σ /10h/1deg ² (polarised)	—	0.59 mJy	1.2 mJy	4.1 mJy
Surface brightness sensitivity 5 σ /10h/1deg ² (unpolarised)	0.31 MJy/sr	0.21 MJy/sr	0.11 MJy/sr	0.19 MJy/sr
Sensitivity to map Stokes parameters (Q,U) at 5% level 5 σ /10h/1deg ²	—	6.0 MJy/sr	3.0 MJy/sr	5.5 MJy/sr

- Instantaneous FOV: 80"x80"
- Dual-polarisation detectors, except in 50 μ m band
- Sensitivities are quoted per extracted point source (mJy) or per pixel (MJy/sr)
Valid for "faint" sources, degraded by photon noise / detector response for "bright" sources