

HIFI's required area in the FIRST focal plane.

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The HIFI design requires 7 fields-of-view along a radius of the telescope's unvignetted field-of-view. This can not be changed without a drastic redesign of the instrument. The 7 fields of view have to be aligned along a radius, because they are served with a single chopper that has to modulate the viewing direction tangentially with respect to the telescope axis.

The M3 mirror extends to the optical axis. As is clear from the top view, the outermost beam is already quite close to the edge of the unvignetted field of view. Unfortunately, we see no simple way to stay a way from the optical axis. We have considered an arrangement of the 7 FOV's in two rows, but this would seriously affect the chopping symmetry, would still require an M3 of about 70 mm length, and would complicate the design of the common optics assembly.

The width that HIFI requires across the Y axis is 65 mm. This is sufficient to accommodate the 45 mm width of the M3, with a margin of 10 mm on both sides. Further away from the optical bench the beams flare out, filling the $f/8.68$ telescope beam. Adding the cross section required to avoid diffraction losses, the full 65 mm clearance is needed at a height of 375 mm above the optical bench. Higher up the required clearance increases, as is indicated in the view from the Y direction in the bottom-lefthand drawing.

The proximity of vertical surfaces close to the HIFI beams is a concern for the off-axis rejection. Measures to minimize reflections must be considered.

⊙ = Telescope focus

