

# Design Drivers for CMB-S4 SAT Ground Screens at Cerro Toco

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# Key Points

- Groundshield studies for SO and S4 for Cerro Toco have been done
- SO SAT data will be useful for evaluation of SO shielding design
- Cerro Honar is under consideration and has a flatter horizon
  - Tradeoff of systematic error risk vs. programmatic effort to develop Honar

# Design Considerations

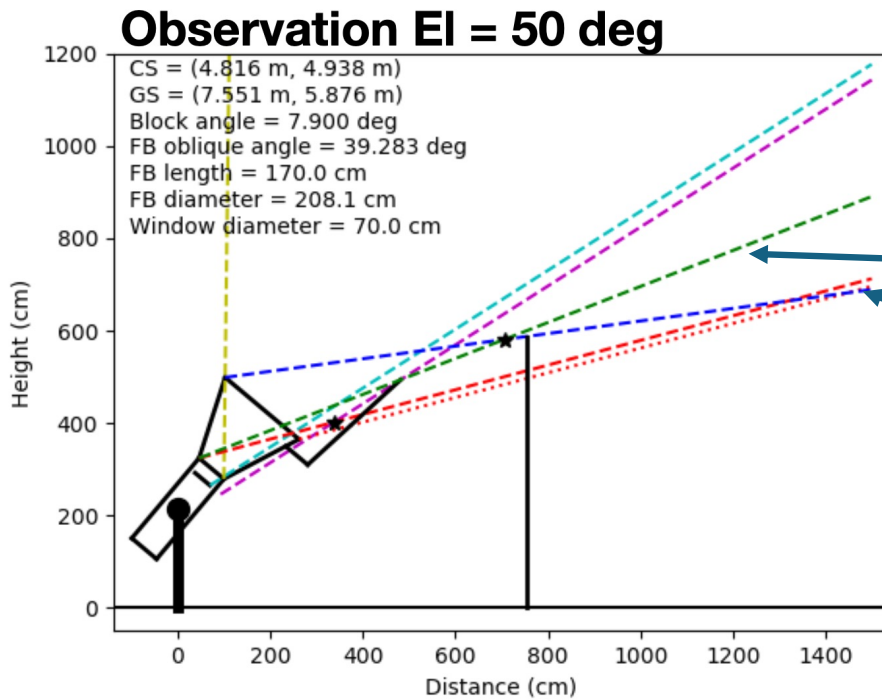
1) All points on the cryostat window can not see the ground (or local peaks or telescopes) except via a path that diffracts twice: “double-diffraction” criterion

2) Block angles beyond the SAT field-of-view for the sun+moon

3) Goal: Edge of forebaffle can not see Toco, LATs, or ground

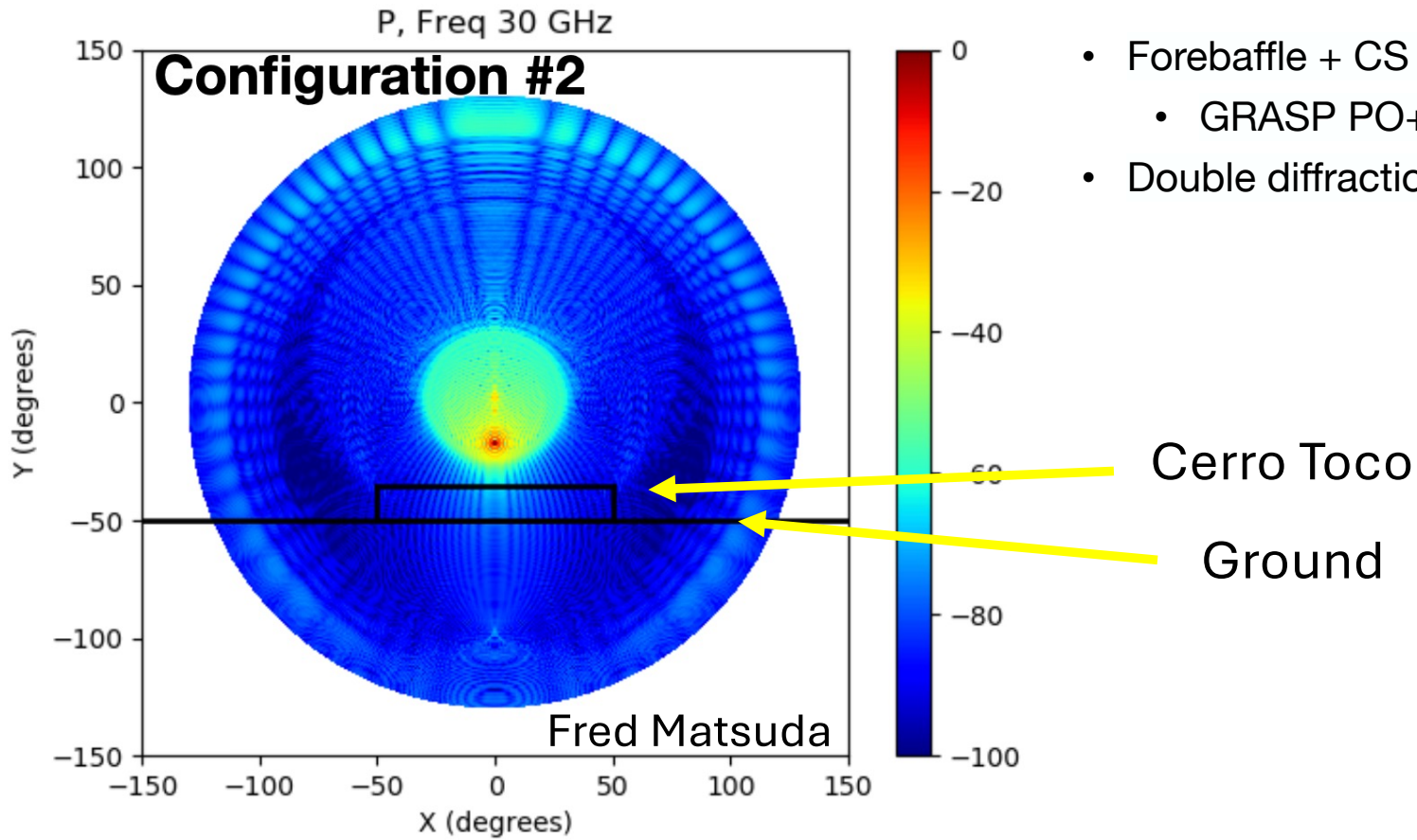
==> Keep size of screens at a minimum while achieving (1) and (2) and maybe (3)

# Example Solution: SO Design



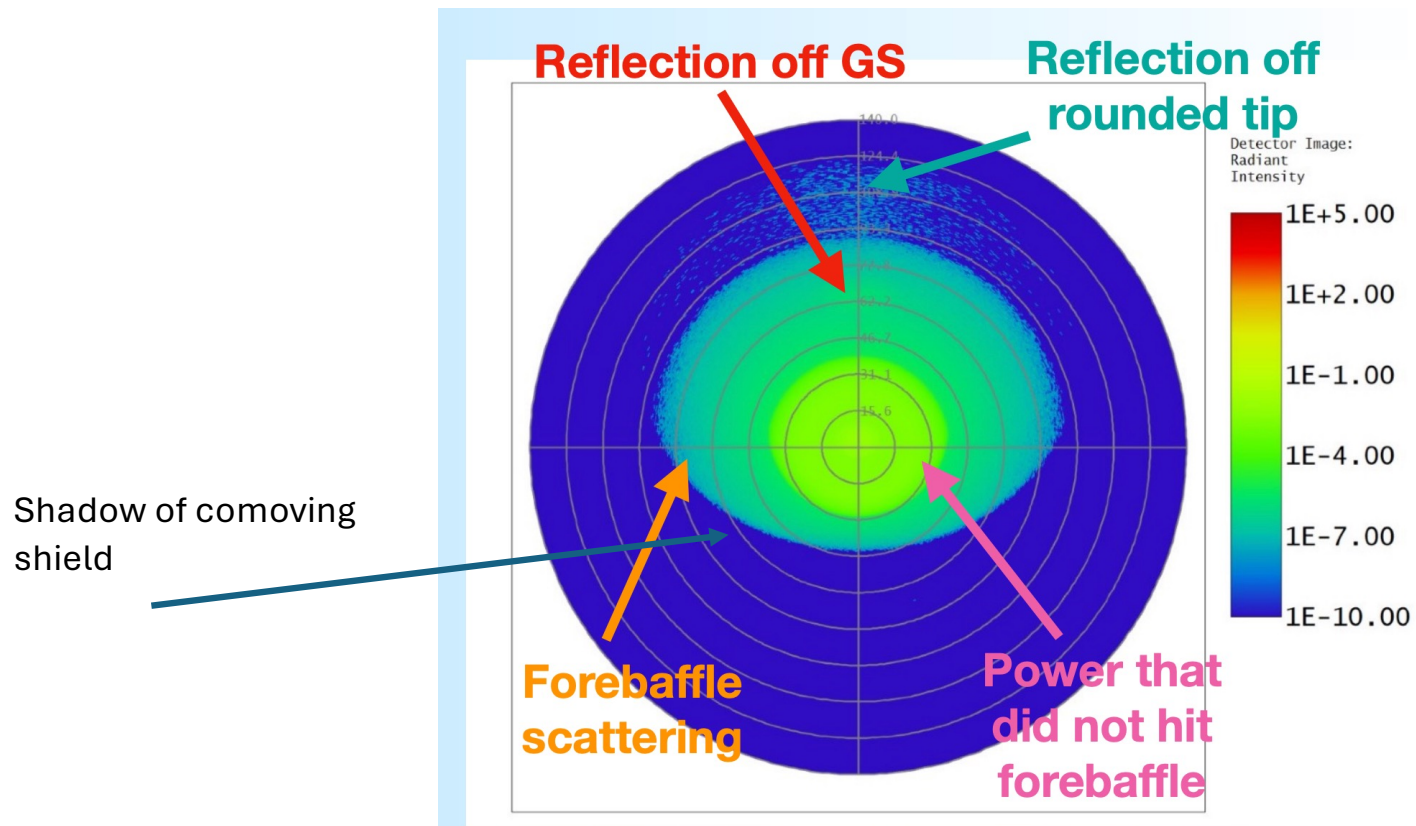
- 3-layer shield
    - Absorbing forebaffle
    - Reflecting Comoving Shield
    - Fixed Reflective Groundshield
- Double-diffraction Path
- Top of shield can see Toco (blocking requires much larger shield)

# GRASP Simulation



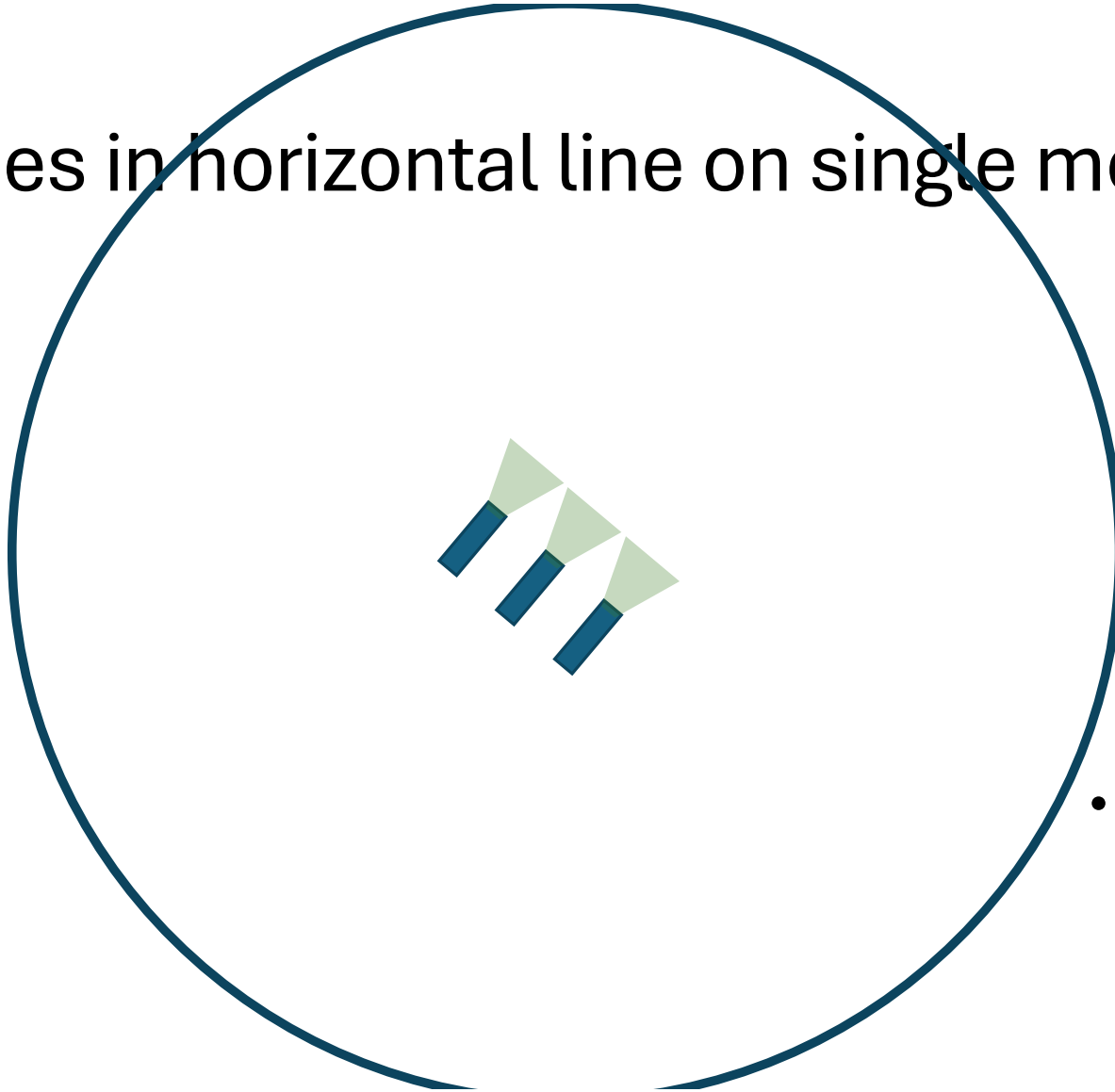
- Forebaffle + CS far field side-lobes
  - GRASP PO+MoM simulations
- Double diffraction side-lobe on Toco

# Window scattering simulation



Fred Matsuda

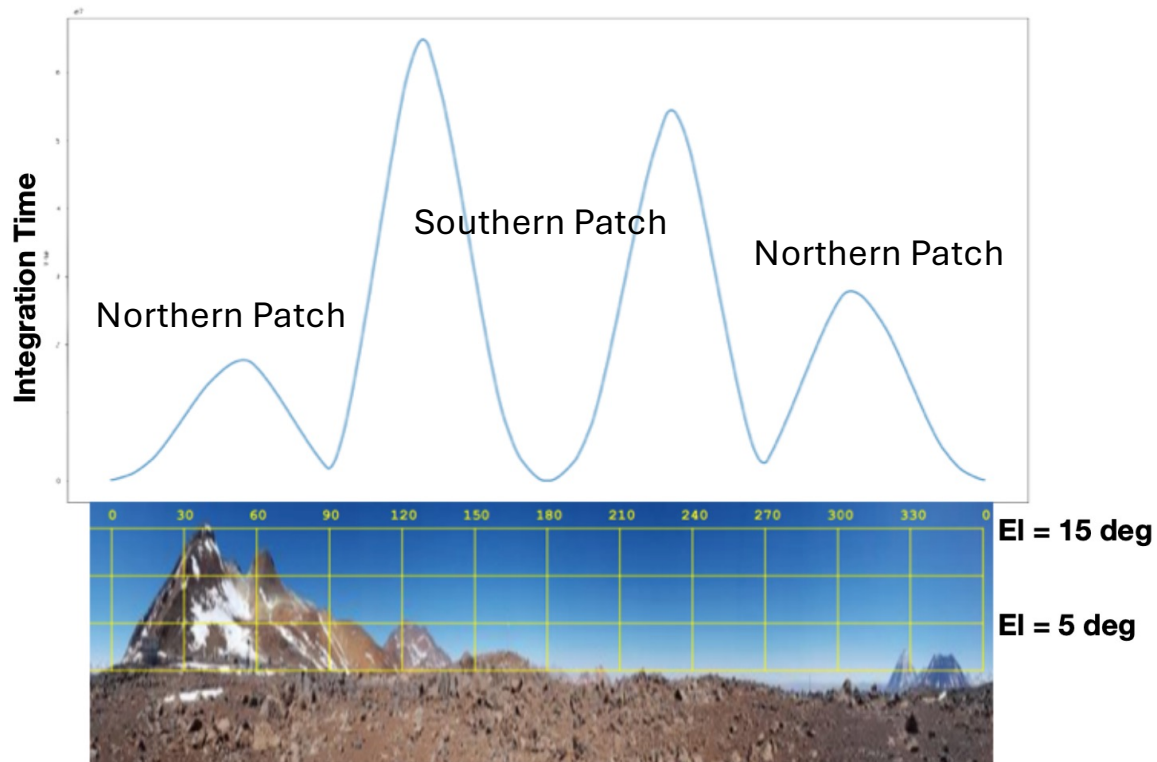
# 3 Tubes in horizontal line on single mount



- Cost Effective use of large radius outer screen

# Important to consider observation strategy

## Az Histogram at Site





backup

# Ground Shield Overview

