

# Detector Array Requirements for CMB-S4

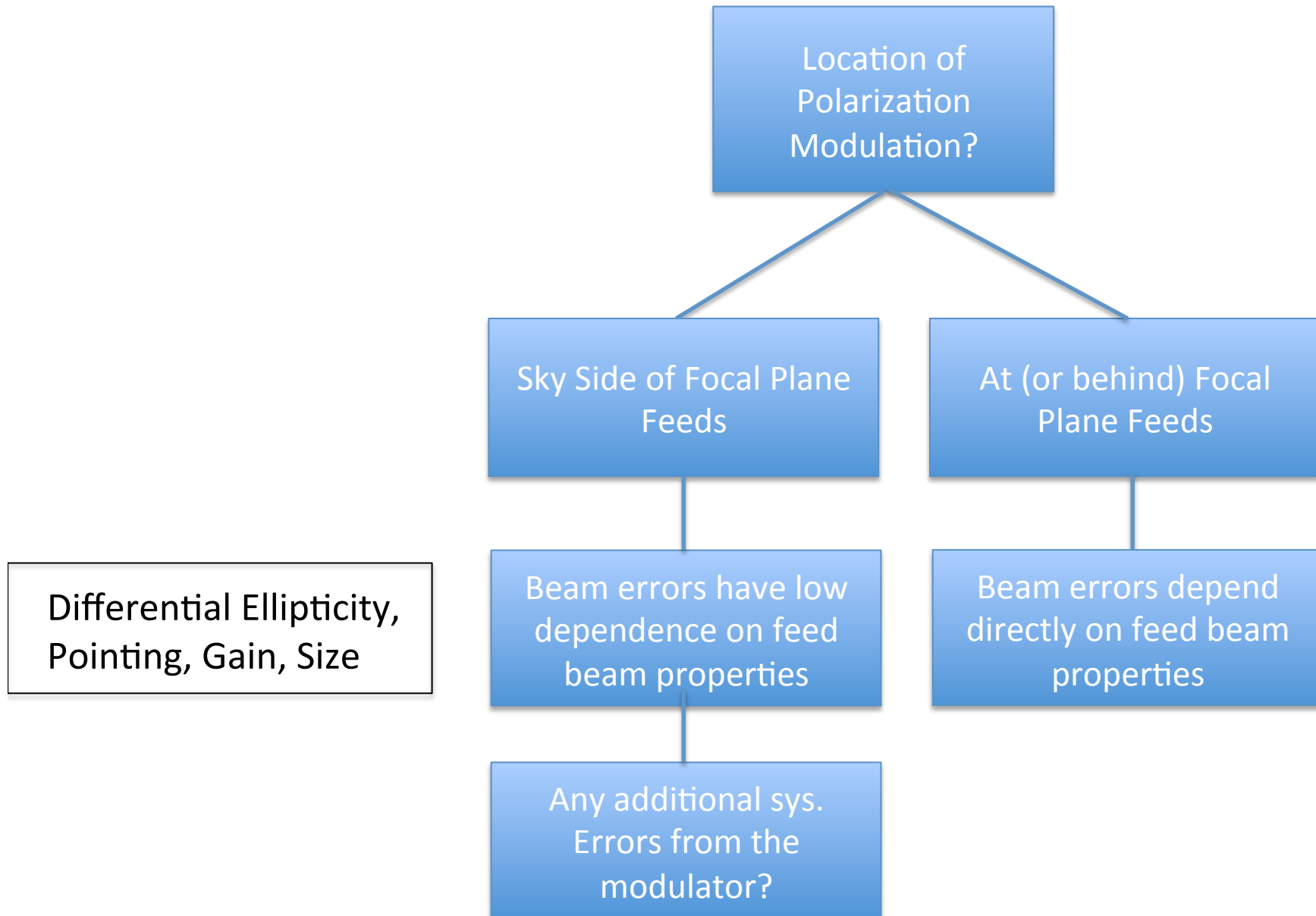
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# Requirements for CMB-S4 Arrays

- Couple light from telescope
  - High optical efficiency
    - Multichroic pixels can increase focal plane usage
  - High polarization purity
  - Low pixel-based beam error
- Define Bands
- Give photon-limited noise (at least in CMB bands...)
- Couple to MUX

# Detector Arrays: T- $\rightarrow$ P Systematic Errors



# Detector Arrays: P->P Systematic Errors

- Cross-Polarization from feeds
  - Beam Monopole -> Calibration
  - Beam higher order ->  $E \rightarrow B$  Leakage
    - Reduced with higher angular resolution
- Frequency-dependent rotation from feeds

Generally, these effects are small...but keep an eye on them.

# More Considerations

- Scalability to  $O[500,000]$  elements
- Quality Control and Detector testing required for  $O[500,000]$  elements