Need to quantify impact on delensing/*r* from LAT systematics

- High-level view (“flowdown”/ “design validation”): requirements at technical, measurement, and science levels.
- At upcoming reviews, variants of the question “how much sigma(r) degrades if requirement on XX is missed by 10%?” with XX being some instrument design aspects/calibration uncertainties.
- Examples*
  - Near sidelobes, far sidelobes
  - Beam leakage (monopole, and up)
  - Gain variation
  - Readout crosstalk
  - Detector time constant
  - Polarization angle/efficiency
  - Polarized atmosphere
  - Pointing error
  - Others?

* thanks to John R. for some of the following

Path towards quantifying impact on delensing/*r* from LAT systematics

- Generate simulations
  - Time-domain effects (expensive to make)
  - Reduce computation if averaged over wafer/band for certain classes of systematics
    - Jeff M. and student Alec H. started to implement making systematics maps for effects that could be captured in a beam map (e.g. crosstalk, sidelobes)
    - Not all effects can be captured this way
  - Related discussion at Technical to Measurement parallel
    - How to build confidence in these simulations given data from current experiments?
- Analysis needs
  - Two runs with same CMB/foreground/noise, but with and without systematics maps → no sample variance to quantify bias.
  - Prioritize effects that are hard to model.
  - Do runs on multiple realizations with flat-sky code (faster); select a few to do curved-sky analysis for completeness.
- Will require people time/resources, both to get organized and to do the work to validate the designs.

Sessions relevant to LAT systematics

- Large Aperture Telescopes parallel (happening concurrently)
- Design Validation: Technical to Measurement parallel
  - ACT, SPT, Simons Array
- Site infrastructure, integration & commissioning parallel
  - LAT/SAT calibration infrastructure requirements & strategy