

SPT-3G: detectors from Stage-3 to Stage-4



- ▶ Three-band multichroic TES pixels (sinuous antenna design). Arrays on 150 mm wafers.
- ▶ 10 wafers delivered to SPT for the full SPT-3G focal plane.

- ▶ Production throughput is high. 2-3 weeks for a 5 wafer batch (batch size rather arbitrary). Interleaved fabrication yields 5 arrays every 1-2 weeks.
- ▶ Fabrication throughput comparable to testing time.
 - Array characterization limited by systematic uncertainties (e.g. NDF calibration) and statistics (need to measure a sufficiently large number of detectors).
- ▶ Primary variation in detector performance arises from film properties, not detector architecture.
 - For S4 scale fabrication, need to develop an empirical model connecting film properties to cryogenic performance. Characterization needs to be at relevant statistical and systematic power.
 - Need to develop techniques for evaluating, monitoring and controlling thin film properties without requiring full array cryo testing for feedback.