



# Constraining cosmology with the summer fields of the South Pole Telescope

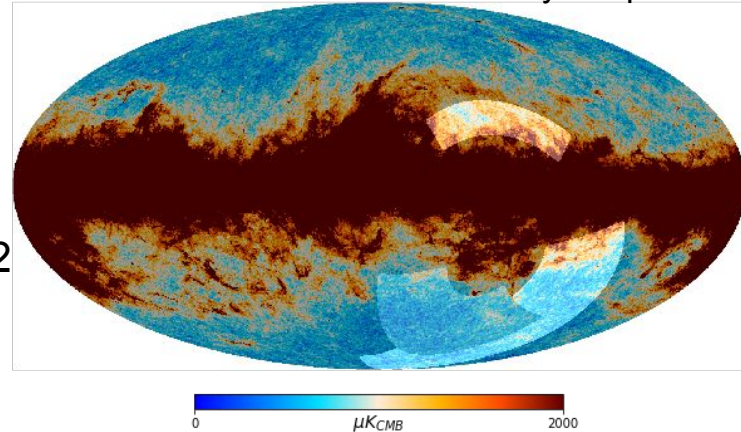
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on behalf of the [NEUCosmoS](#) team  
and the SPT-3G collaboration

GDR CoPhy  
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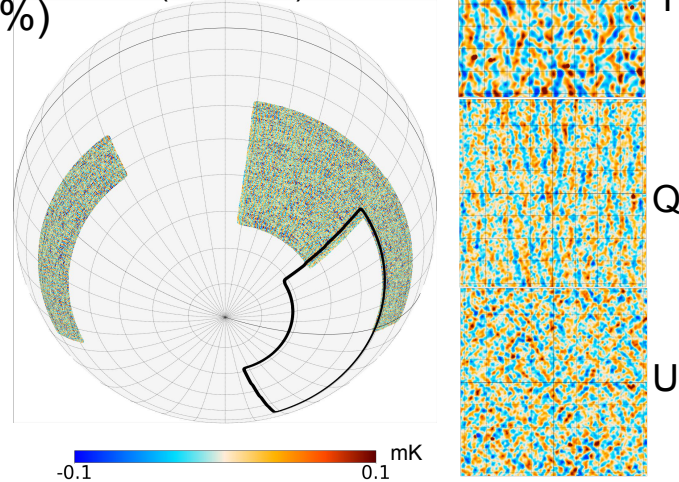
# SPT-3G Summer fields

- SPT-3G winter (baseline): **1700 deg<sup>2</sup>**
  - See Dutcher et al. 2021, Balkenhol et al. 2021, 2022
  - Analysis of the next release is ongoing
  - See talk by K. Benabed tomorrow
- **Summer fields:** extension of the SPT-3G winter field **2800 deg<sup>2</sup> (6.6%)** = 1300 (3.1%) + 600 (1.4%) + 900 (2.1%)
  - Observing **~4 months** per year during austral summer
  - Map depth of 2 years of summer observations is ~2.5 times lower than the 2019+2020 winter field
  - 3 times larger sky fraction than winter  
→ reduce sample variance

Planck 353 GHz and SPT-3G sky footprint



SPT-3G summer fields I map (150 GHz)



# SPT-3G primary CMB anisotropies forecasts

## 1. SPT-3G Winter field

- $\Lambda$ CDM constraints **comparable with Planck**, and largely independent from it
- SPT-3G TT/EE/TE + Planck will improve (most of the)  $\Lambda$ CDM parameters by a factor 2

## 2. SPT-3G Winter + Summer fields

- $\Lambda$ CDM constraints with SPT-3G TT/TE/EE\* improve by **~15–20%** when including summer
- Summer fields will help to test **extensions of  $\Lambda$ CDM**:  
 **$\Lambda$ CDM+N<sub>eff</sub>** constraints with SPT-3G TT/TE/EE are expected to improve by up to **~40%** when including summer

