



**ACTPOL**

**Erminia Calabrese**

**CARDIFF**  
UNIVERSITY  
PRIFYSGOL  
CAERDYDD



**Science & Technology**  
Facilities Council

**CMB foregrounds for B-mode studies**  
**Tenerife, October 15<sup>th</sup> 2018**



**POLARBEAR/Simons Array**

**ACT**

**CLASS**

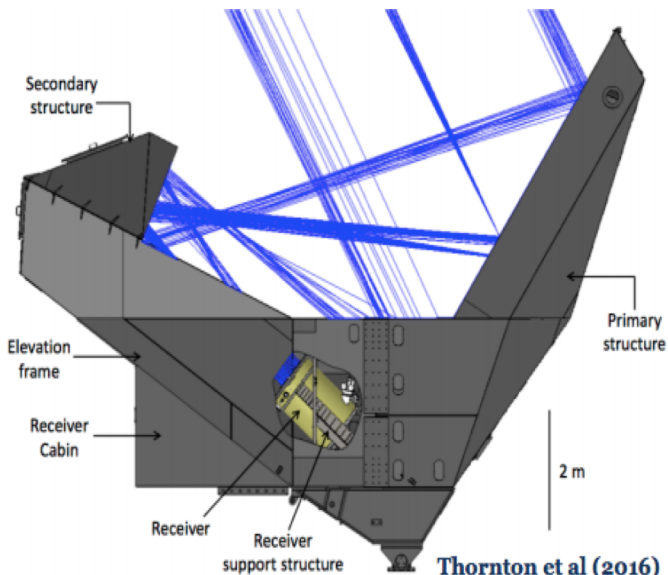
**Simons Observatory (soon)**

Google





# The Atacama Cosmology Telescope



## ACT 'MBAC'

Temp in south and equator at 148/218 GHz over 600 deg<sup>2</sup>

## ACTPol

Temp + Pol at 90/150 GHz over 3000 deg<sup>2</sup>

## Advanced ACTPol

Temp + Pol at 5 frequencies over 40% of the sky

2007

2010 2013

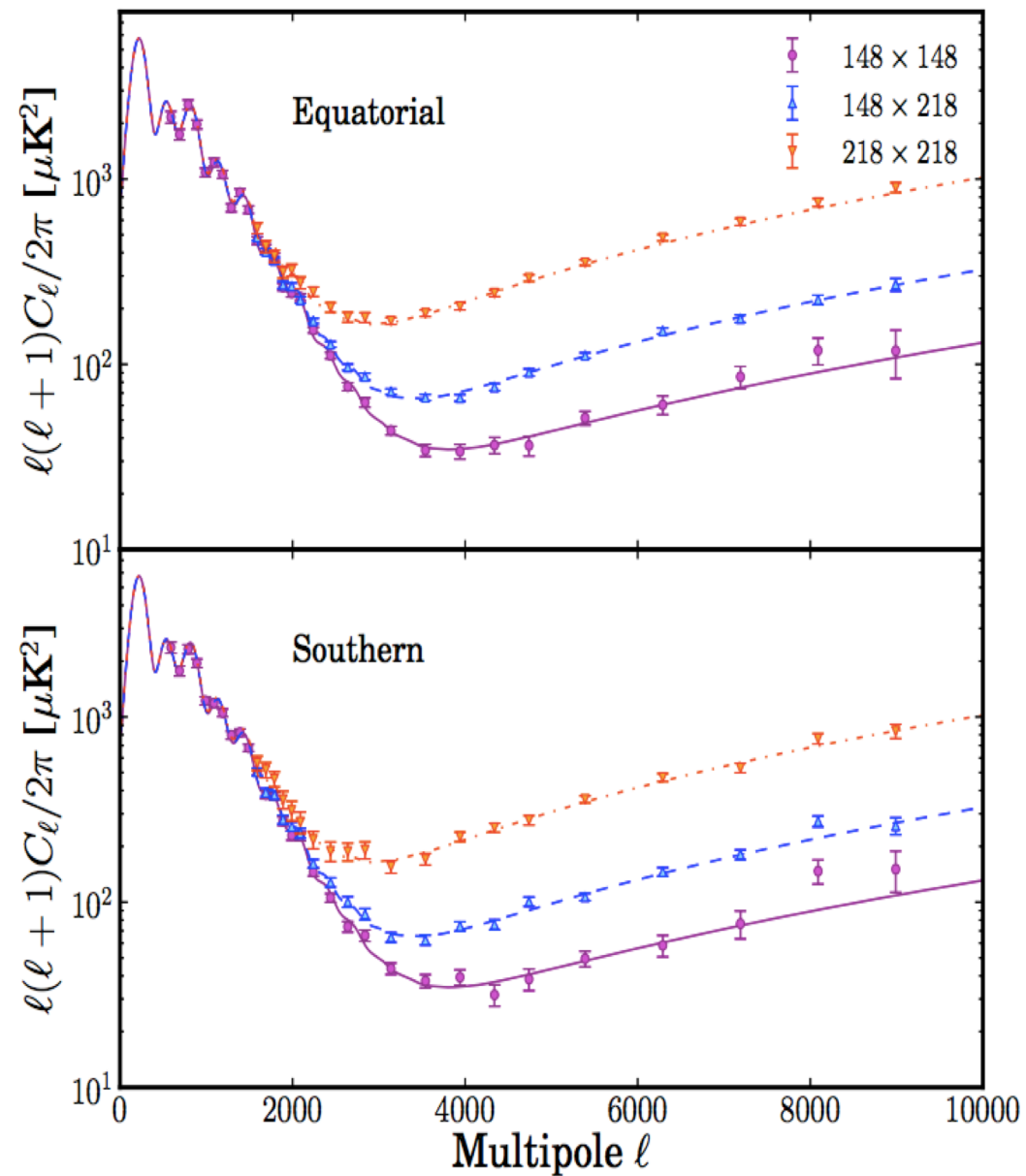
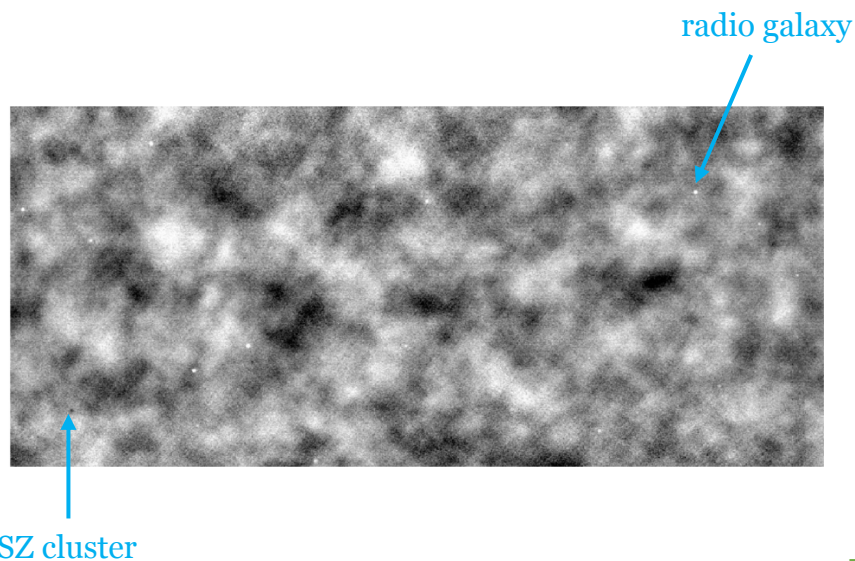
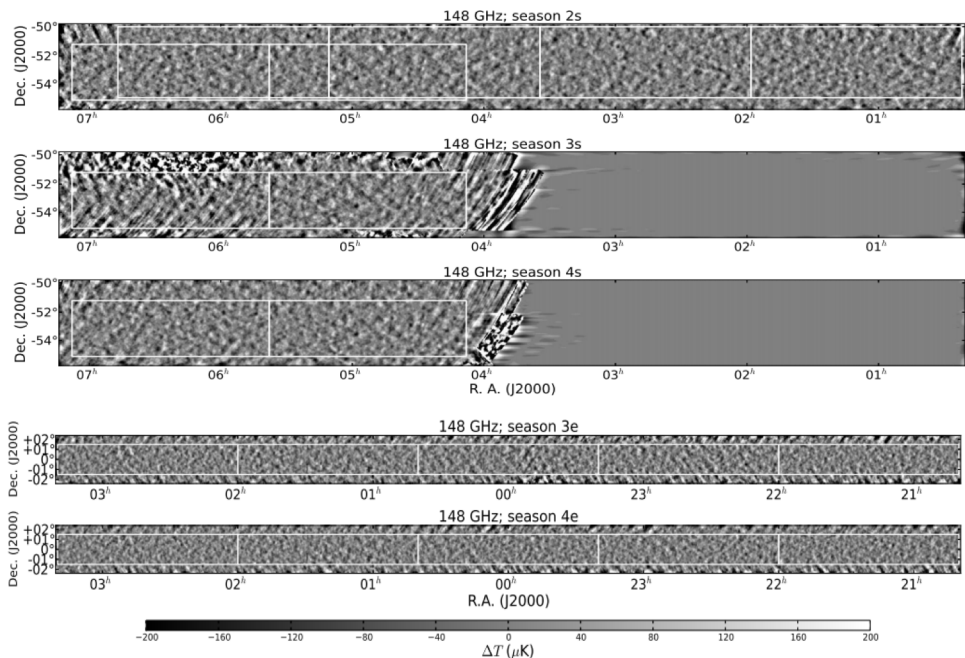
2015 2016

2018 2021





# ACT CMB

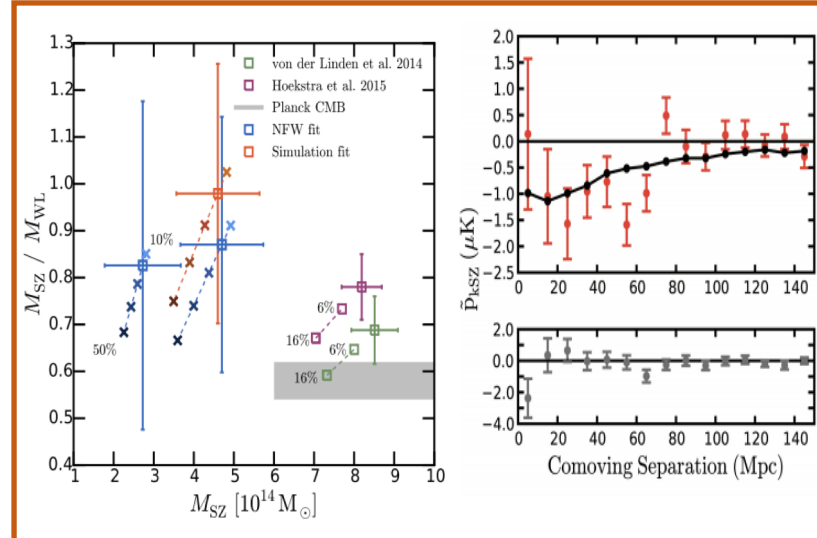
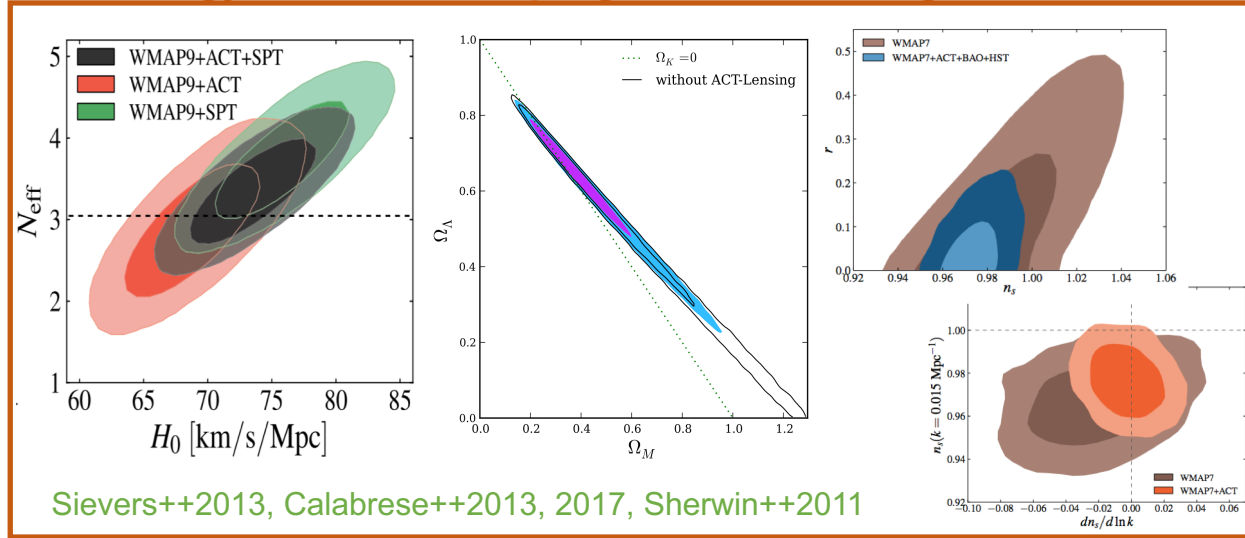




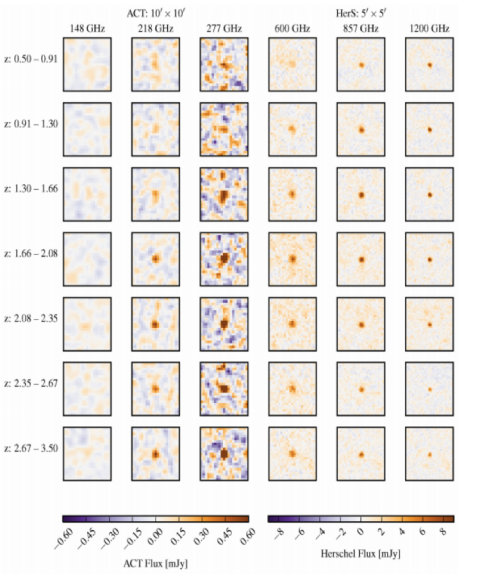
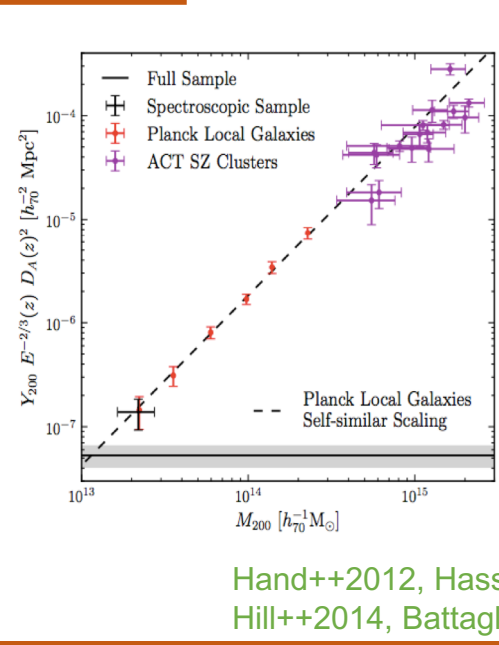
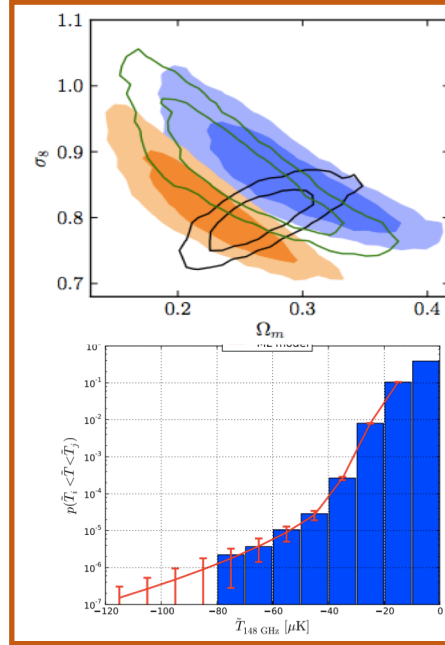
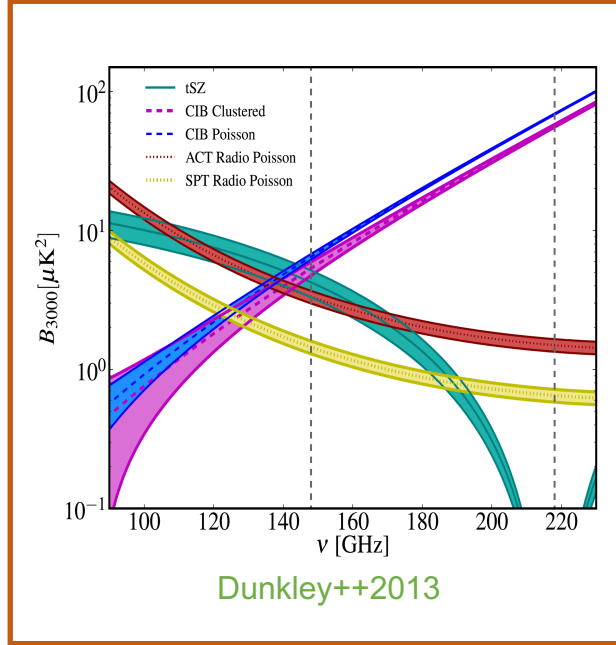
# ACT: highlights

## Cosmology from the damping tail and lensing

## SZ clusters and sources



## Extragalactic emission from PS



Hand++2012, Hasselfield++2013, Gralla++2014, Hill++2014, Battaglia++2015, Crichton++2016



# ACTPol [s13]

S13  
PA1 @ 150 GHz  
Patches: D1, D2, D5, D6

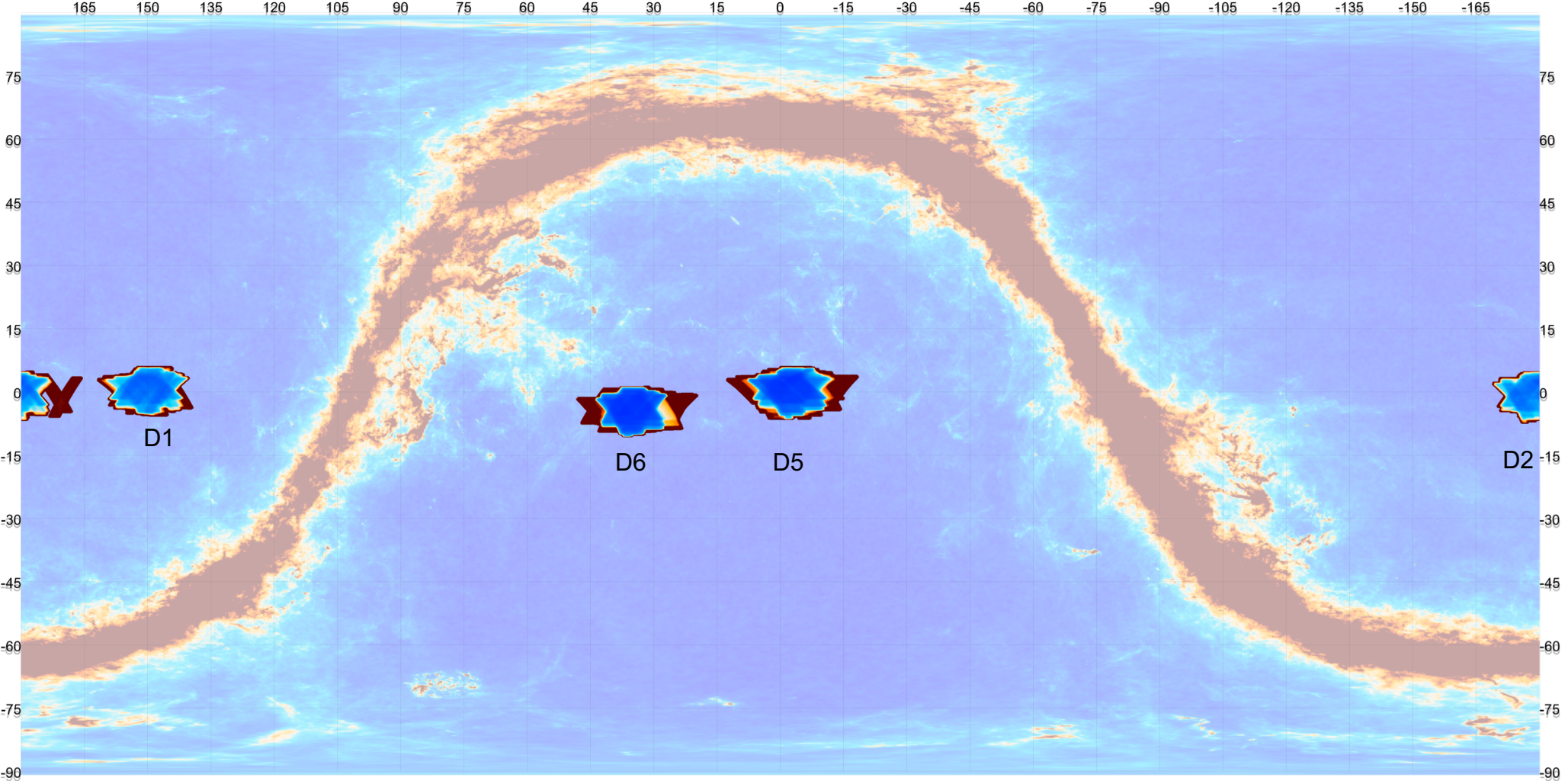
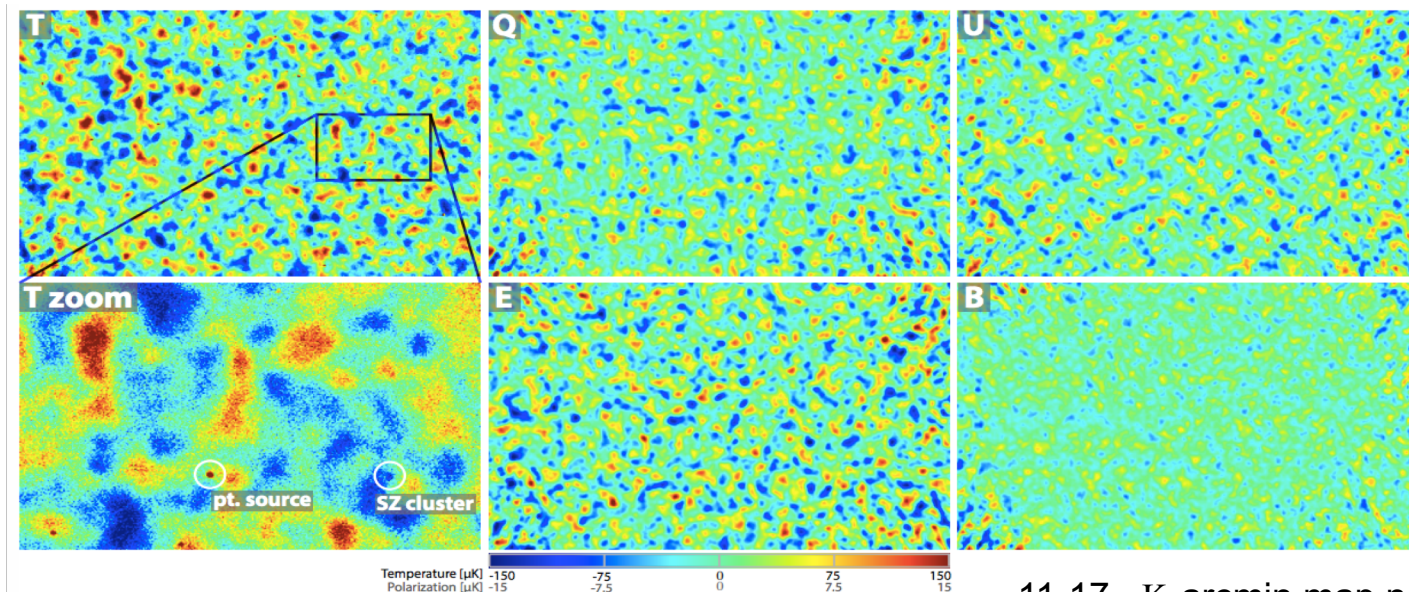


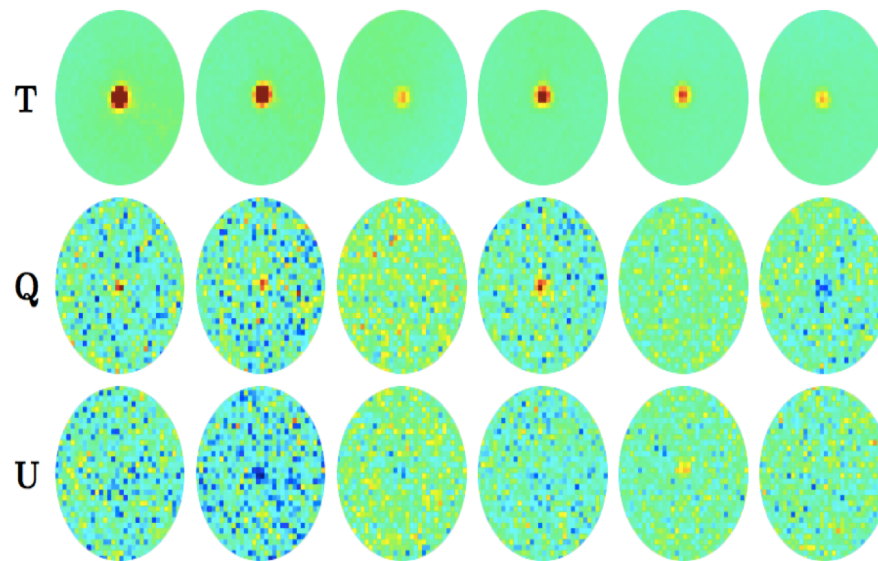
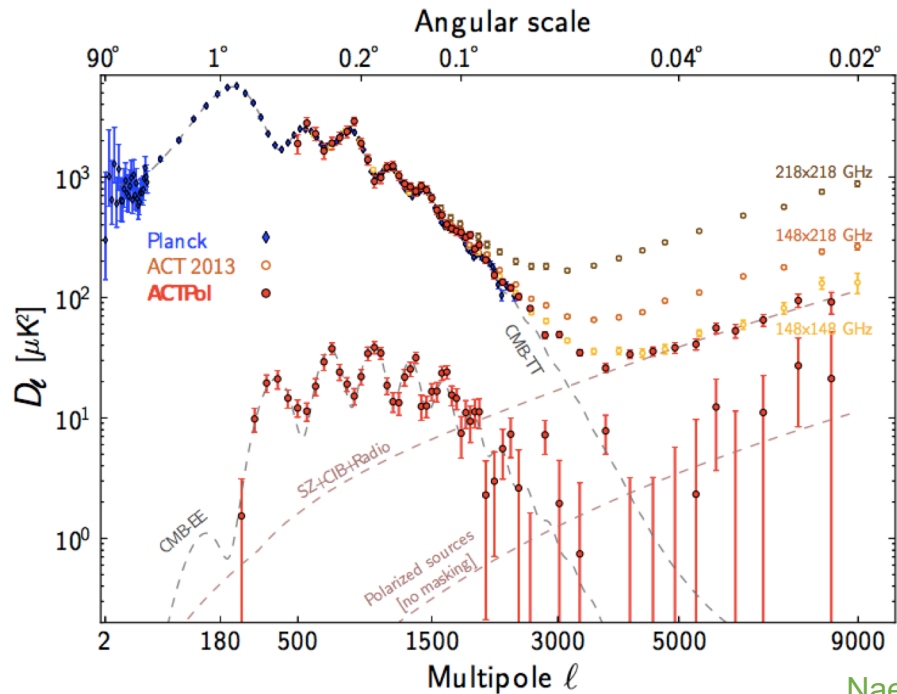
Figure: S. Aiola



# ACTPol [s13]



11-17  $\mu\text{K}$ -arcmin map noise



# ACTPol [s13+s14]

S13  
PA1 @ 150 GHz  
Patches: D1, D2, D5, D6

S14  
PA1/PA2 @ 150 GHz  
Patches: D56, BOSS-N

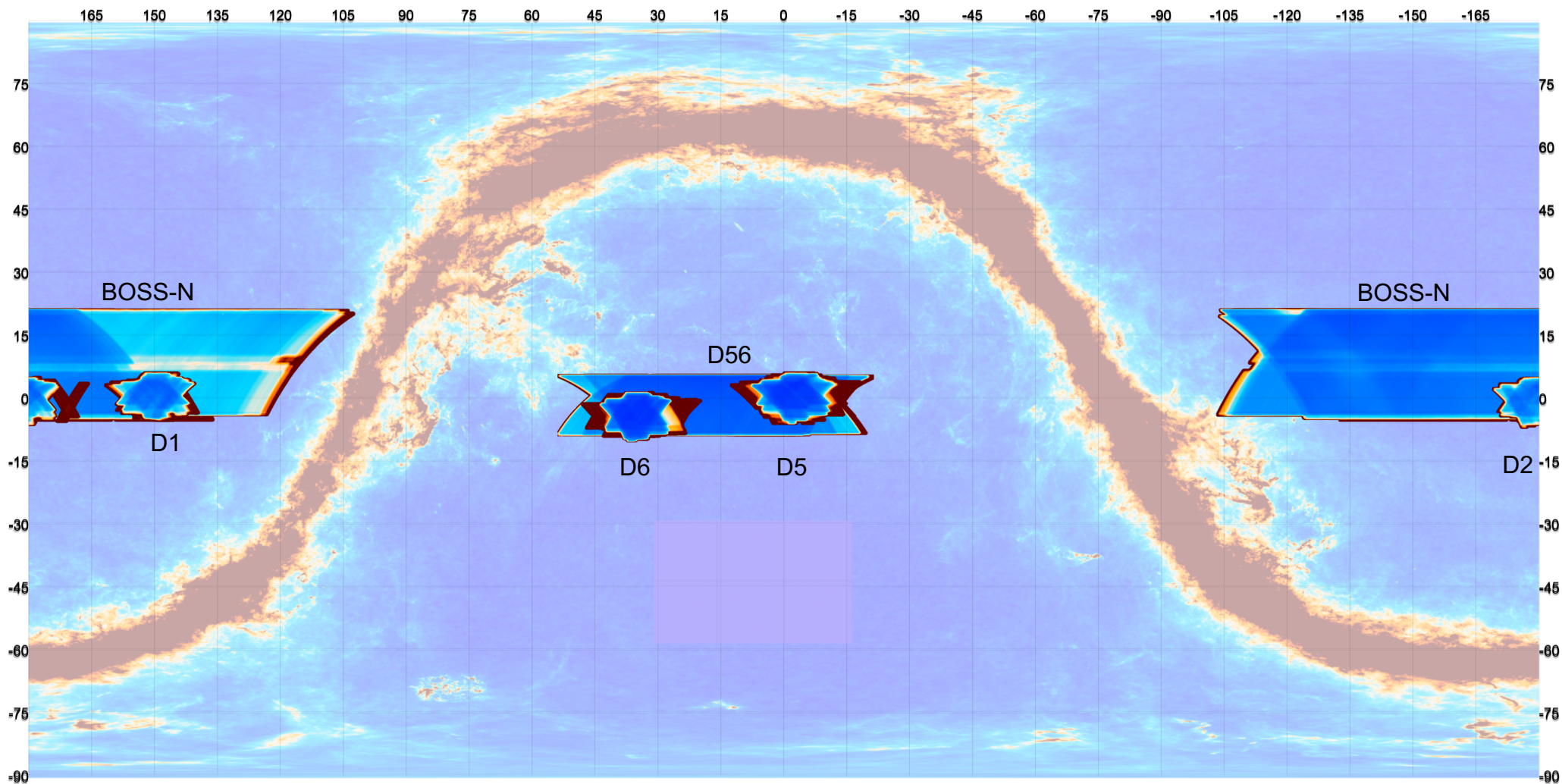
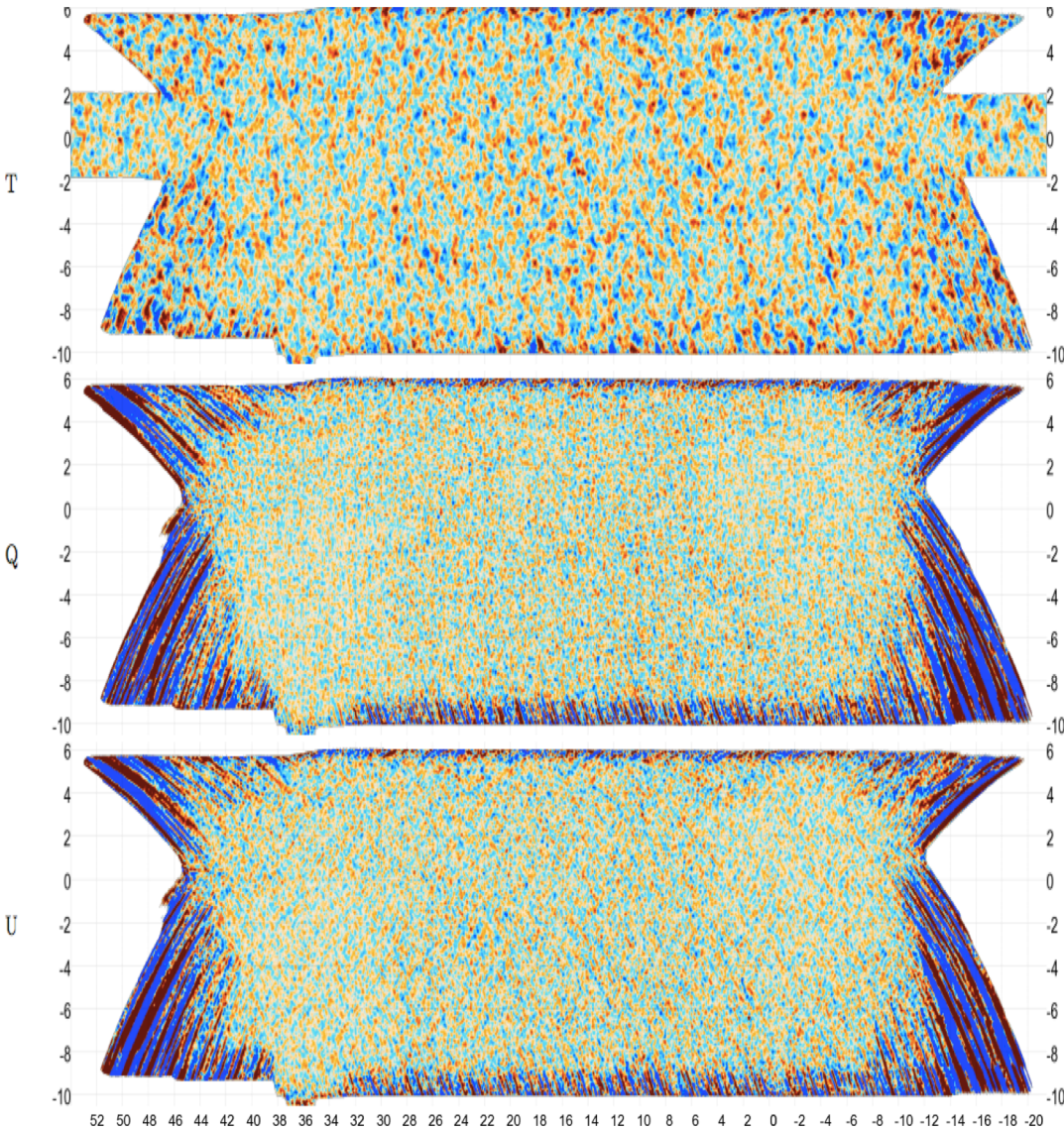


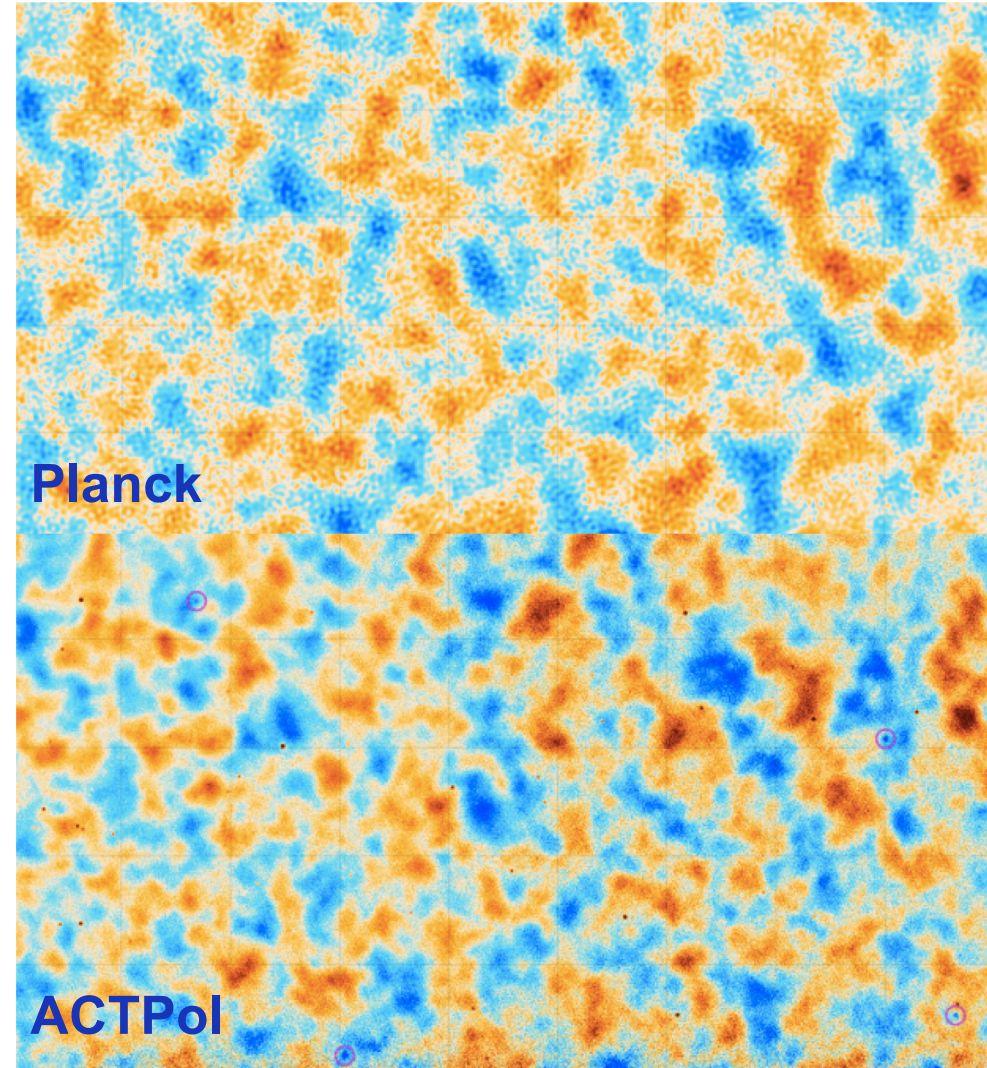
Figure: S. Aiola



# ACTPol [s13+s14]



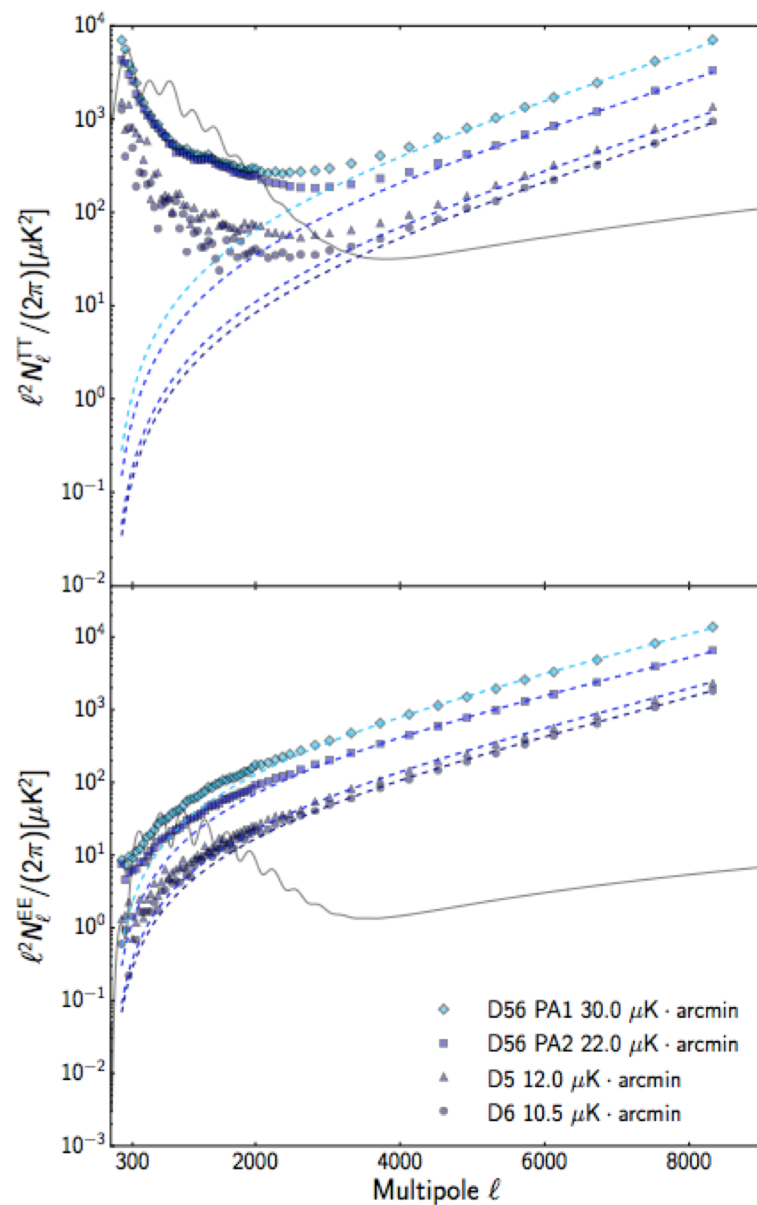
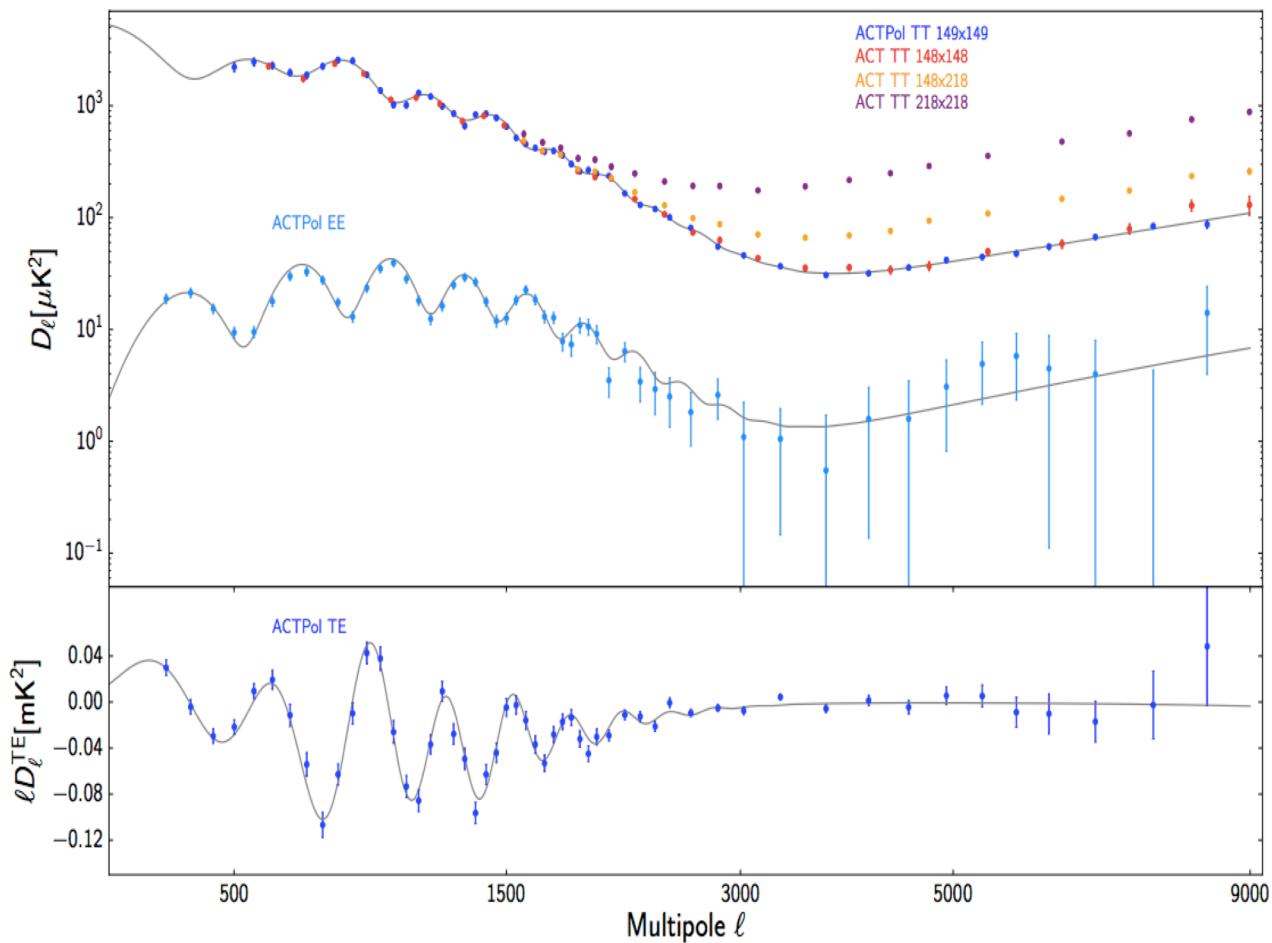
The color scale is  $\pm 250\mu\text{K}$  in T and  $\pm 25\mu\text{K}$  in P.



Figures: S. Naess



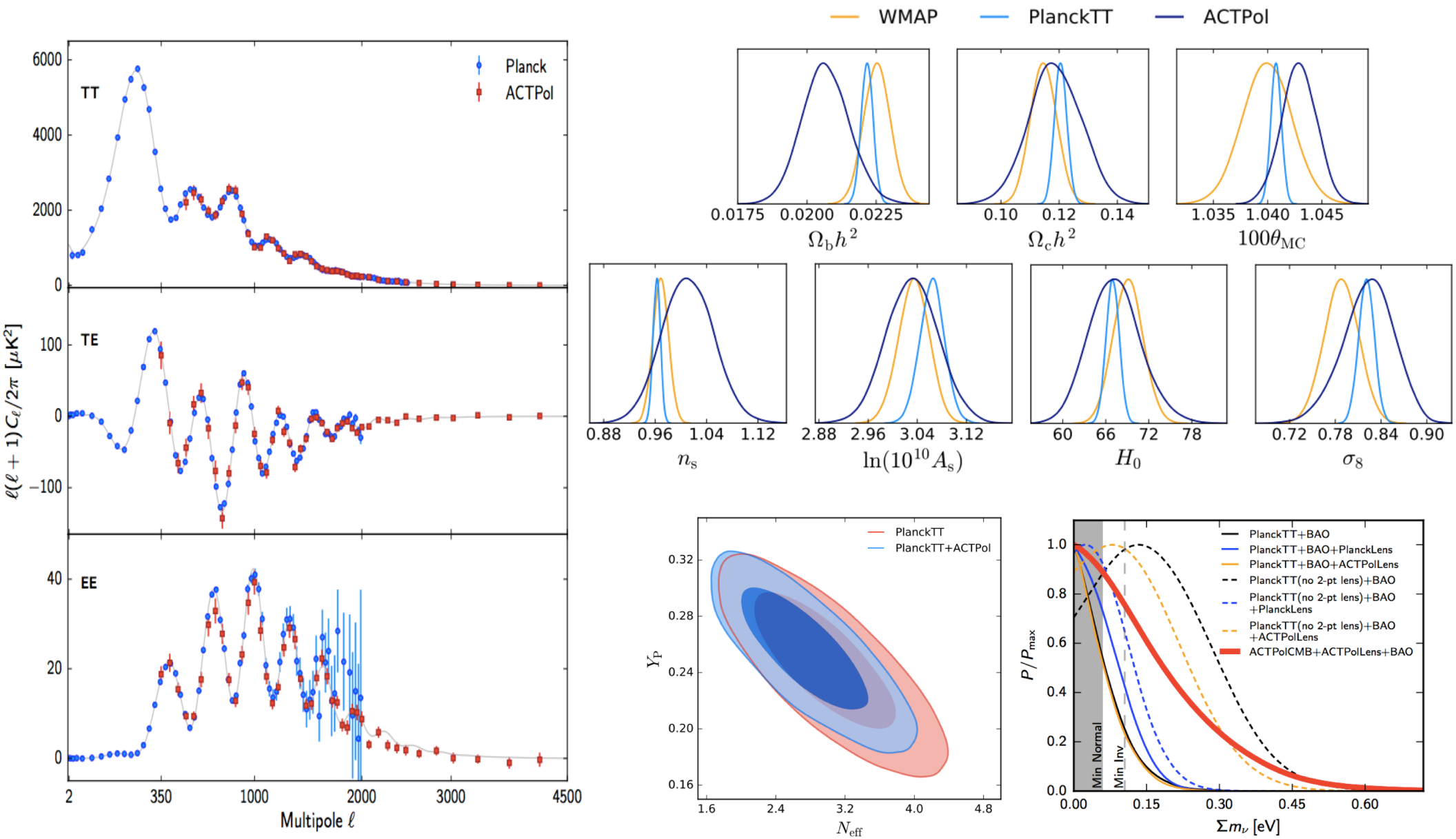
# ACTPol [s13+s14]



Louis++2017

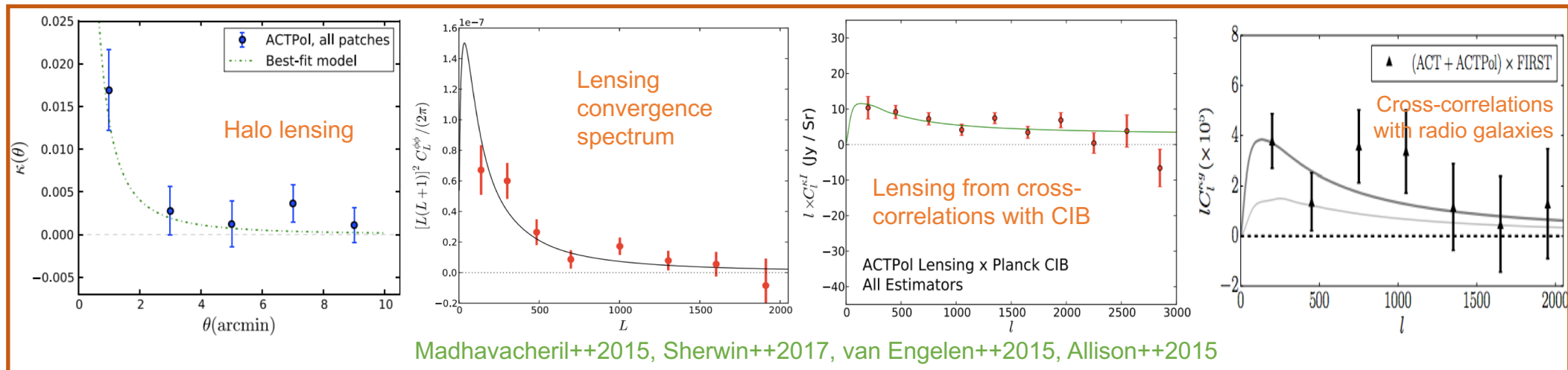


# ACTPol [s13+s14] cosmology

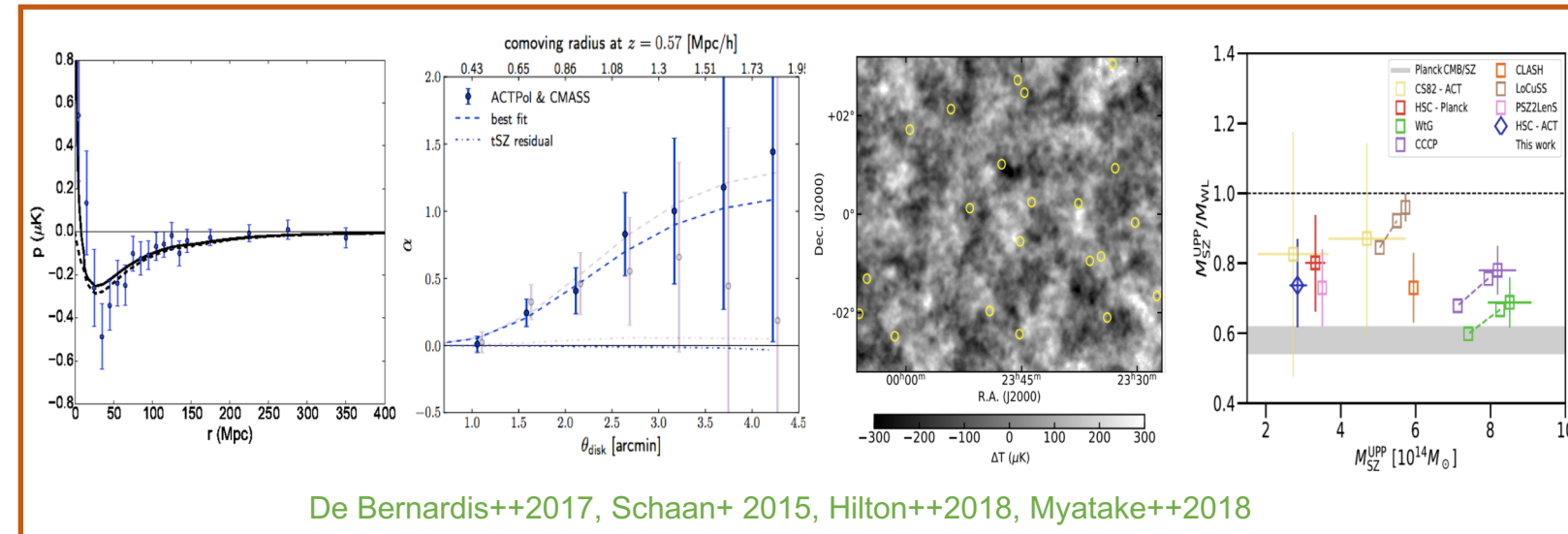


# ACTPol[s13+s14]: extra highlights

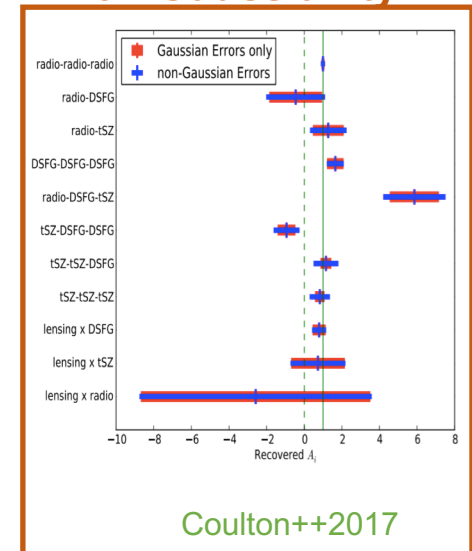
## Lensing science



## SZ clusters and sources



## Non Gaussianity



All data products available on LAMBDA



# ACTPol [s13+s14+s15]

S13  
**PA1 @ 150 GHz**  
Patches: D1, D2, D5, D6

S14  
**PA1/PA2 @ 150 GHz**  
Patches: D56, BOSS-N

S15  
**PA1/PA2 @ 150 GHz**  
**PA3 @ 90/150 GHz**  
Patches: D56, D8, BOSS-N

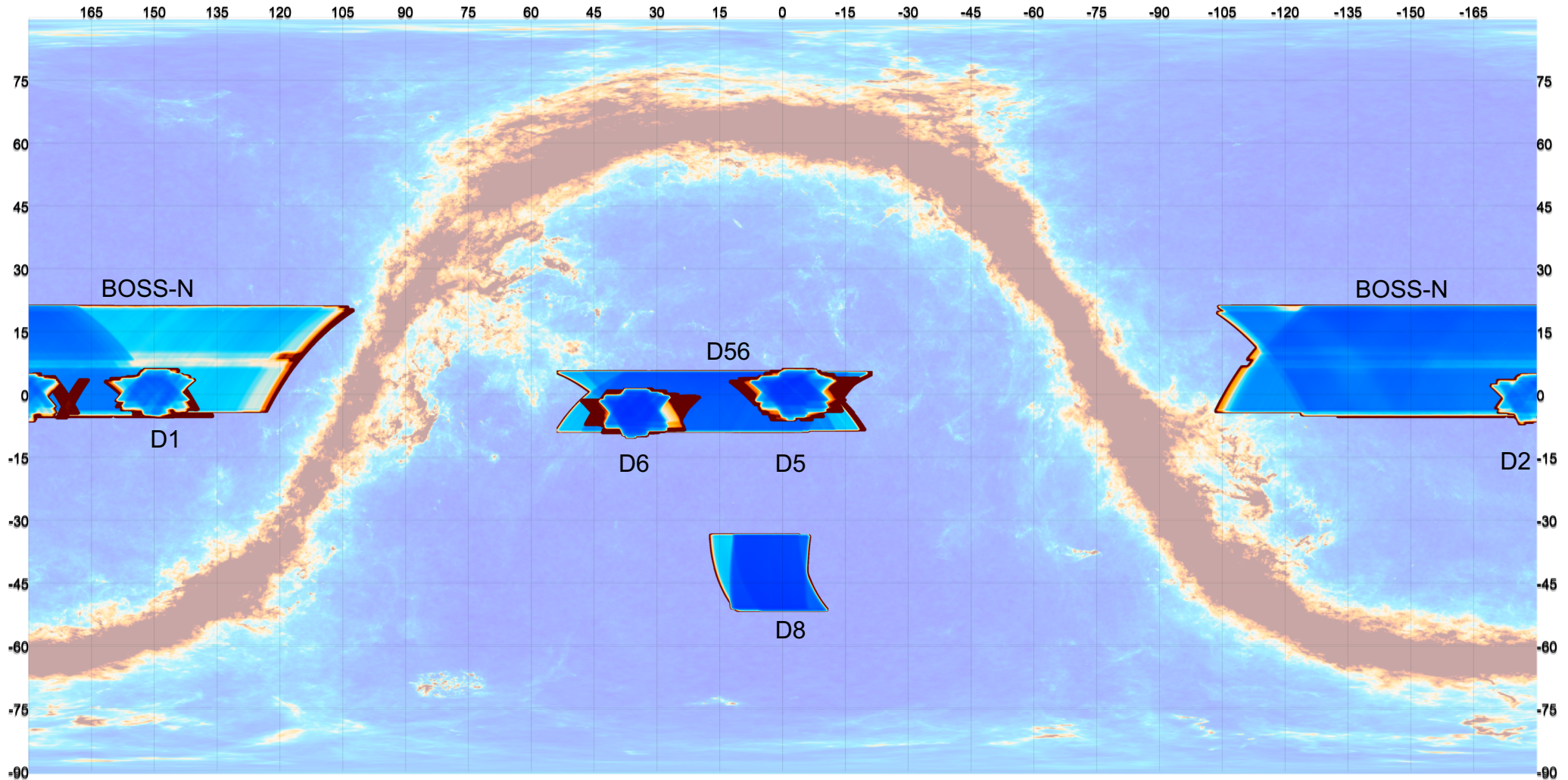
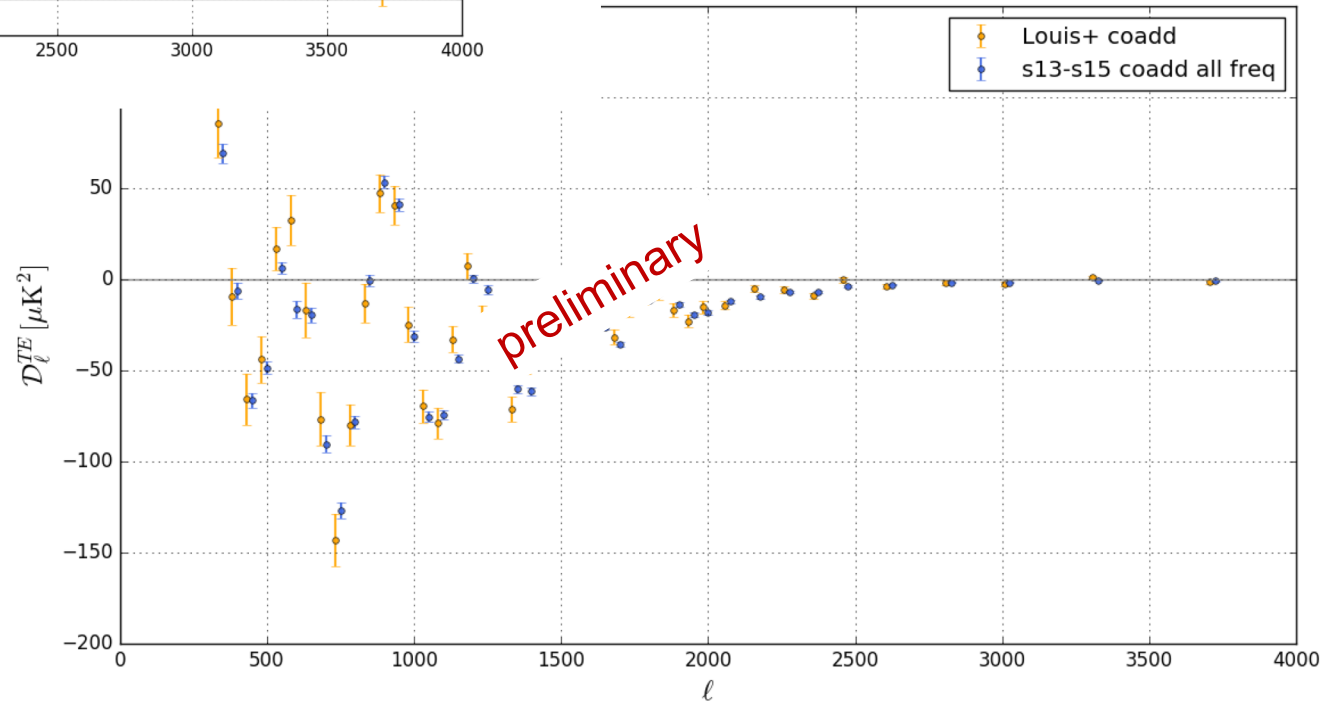
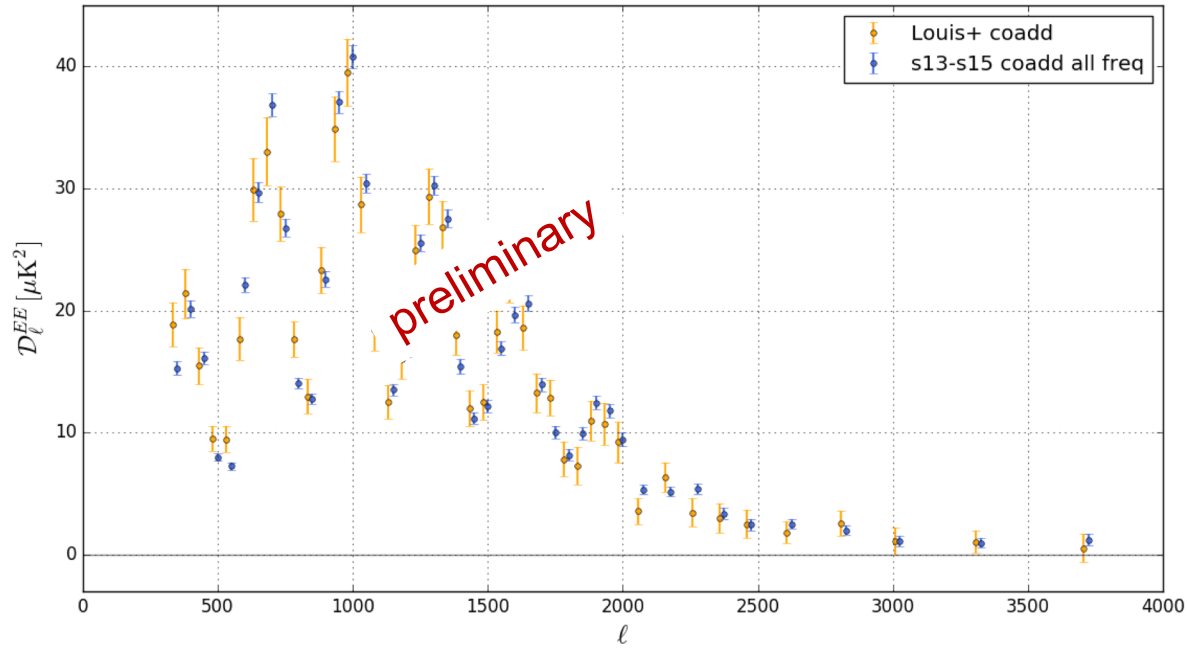


Figure: S. Aiola

# ACTPol [s13+s14+s15] polarization

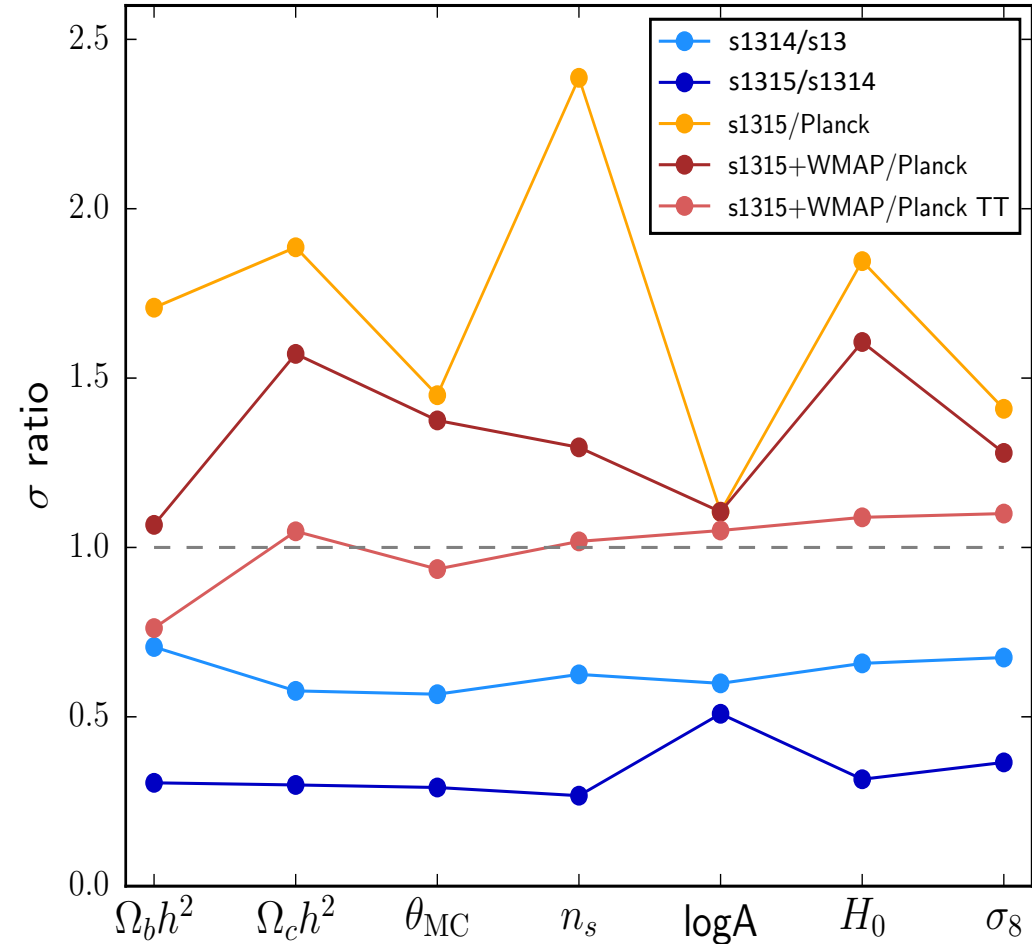


Choi++, Aiola++ to appear



# ACTPol [s13+s14+s15] cosmology

*Forecasts for next release: using actual maps but errors might be bigger*



S. Choi and EC for ACTPol

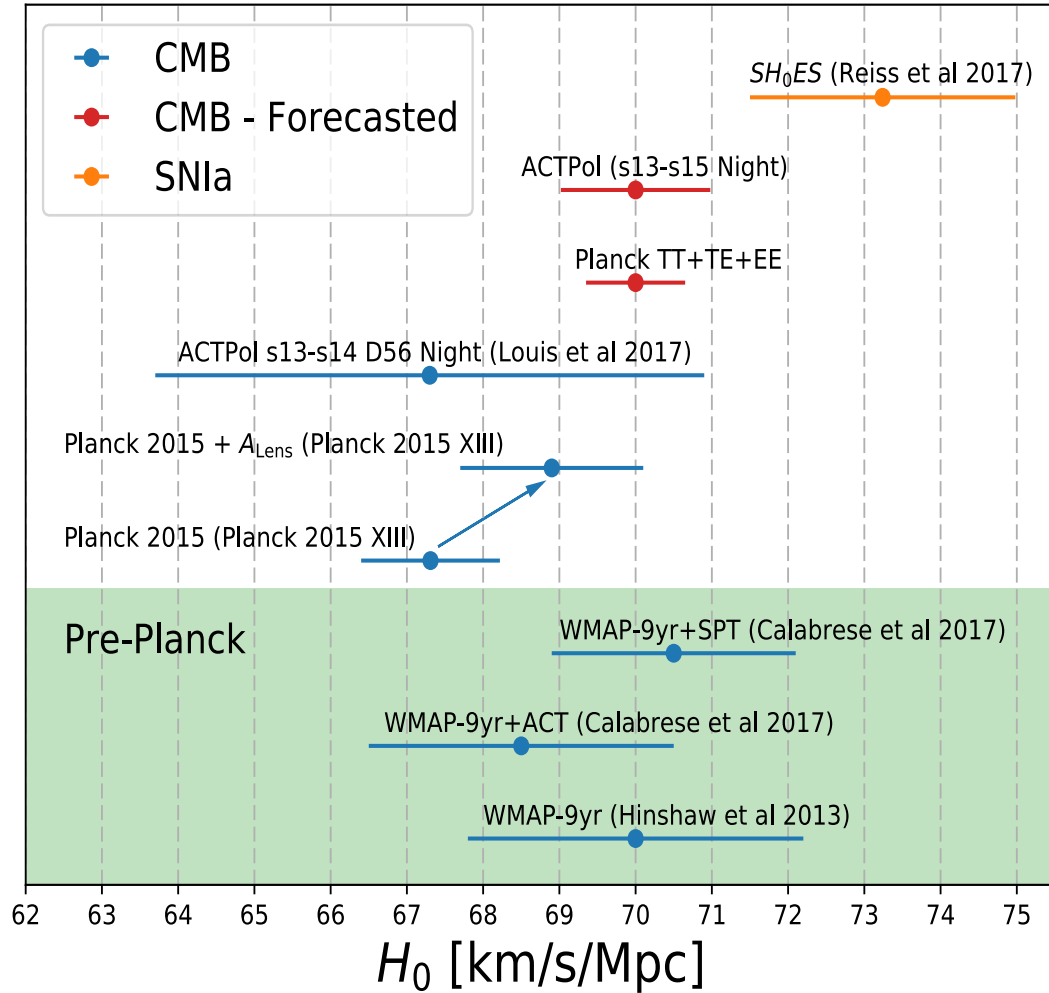


Figure: S. Aiola

# Advanced ACTPol

S16  
PA2 @ 150 GHz  
PA3 @ 90 / 150 GHz  
HF @ 150 / 220 GHz

S17  
MF @ 90 / 150 GHz  
MF @ 90 / 150 GHz  
HF @ 150 / 220 GHz

S18  
LF @ 28 / 41 GHz  
MF @ 90 / 150 GHz  
HF @ 150 / 220 GHz

+19-20-21!

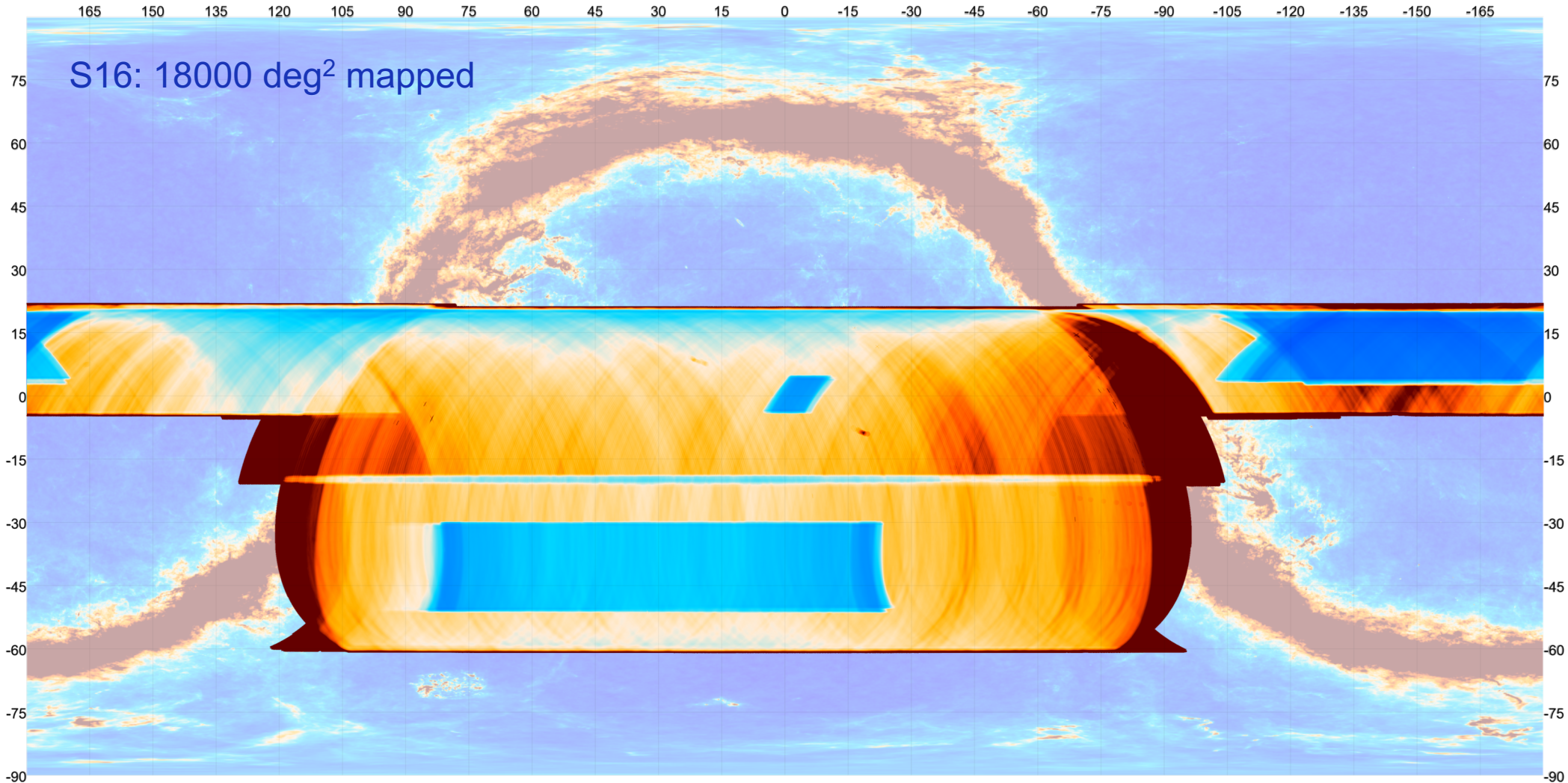
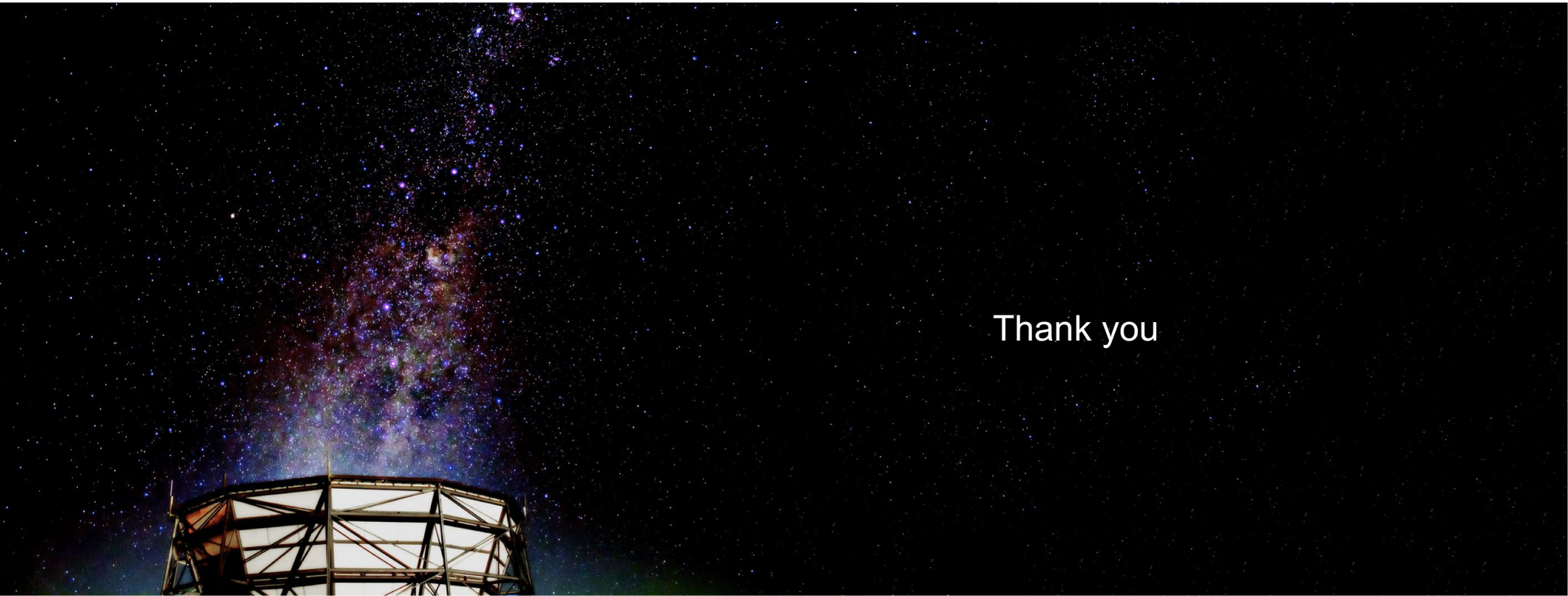


Figure: S. Aiola Map: S. Naess





Thank you