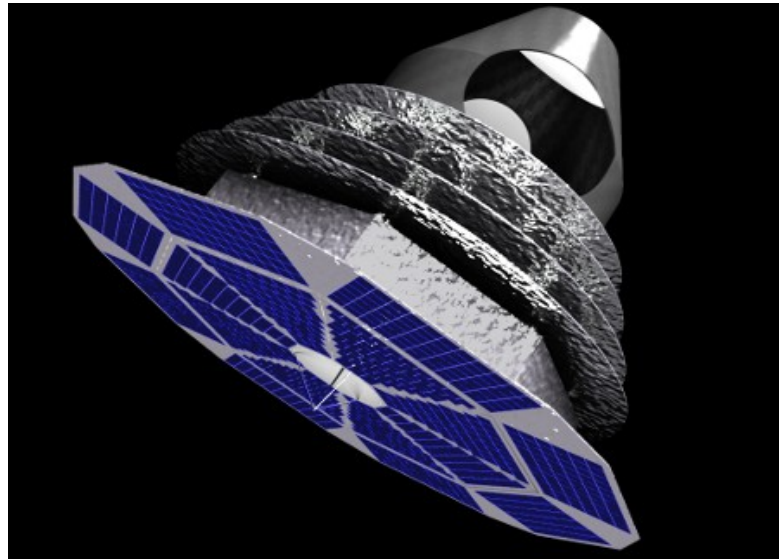


How much can we improve after Planck ? (on cosmological parameters) [Using CMB]



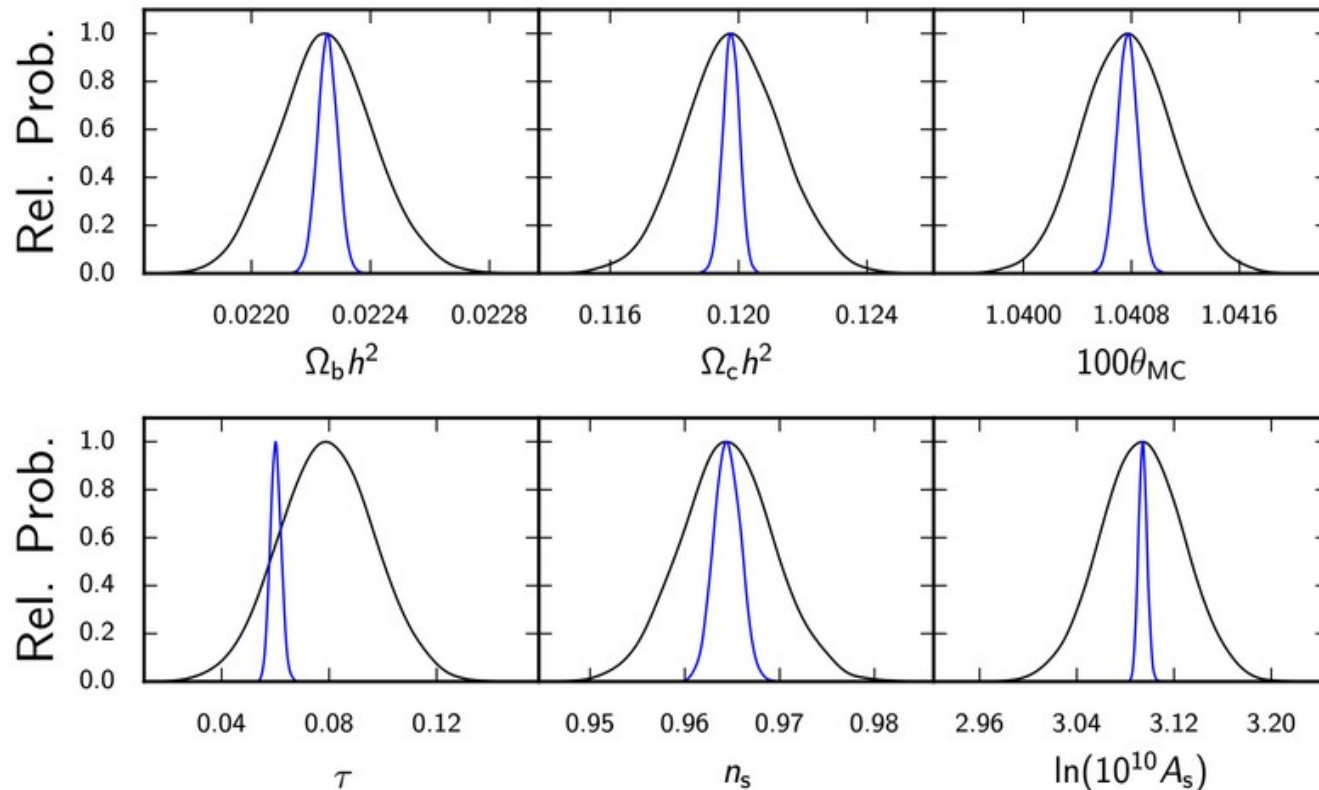
Constraints on Λ CDM

Parameter	Planck TT,TE,EE+lowP	COre
$\Omega_b h^2$	0.02225 ± 0.00016	0.02226 ± 0.00003
$\Omega_c h^2$	0.1198 ± 0.0015	0.1198 ± 0.0003
100θ	1.04077 ± 0.00032	1.04077 ± 0.00007
τ	0.079 ± 0.017	0.060 ± 0.002
n_s	0.9645 ± 0.0049	0.9645 ± 0.0014
$\ln[10^{10} A_s]$	3.094 ± 0.034	3.094 ± 0.003
H_0 [$\text{km s}^{-1} \text{Mpc}^{-1}$]	67.27 ± 0.66	67.29 ± 0.10

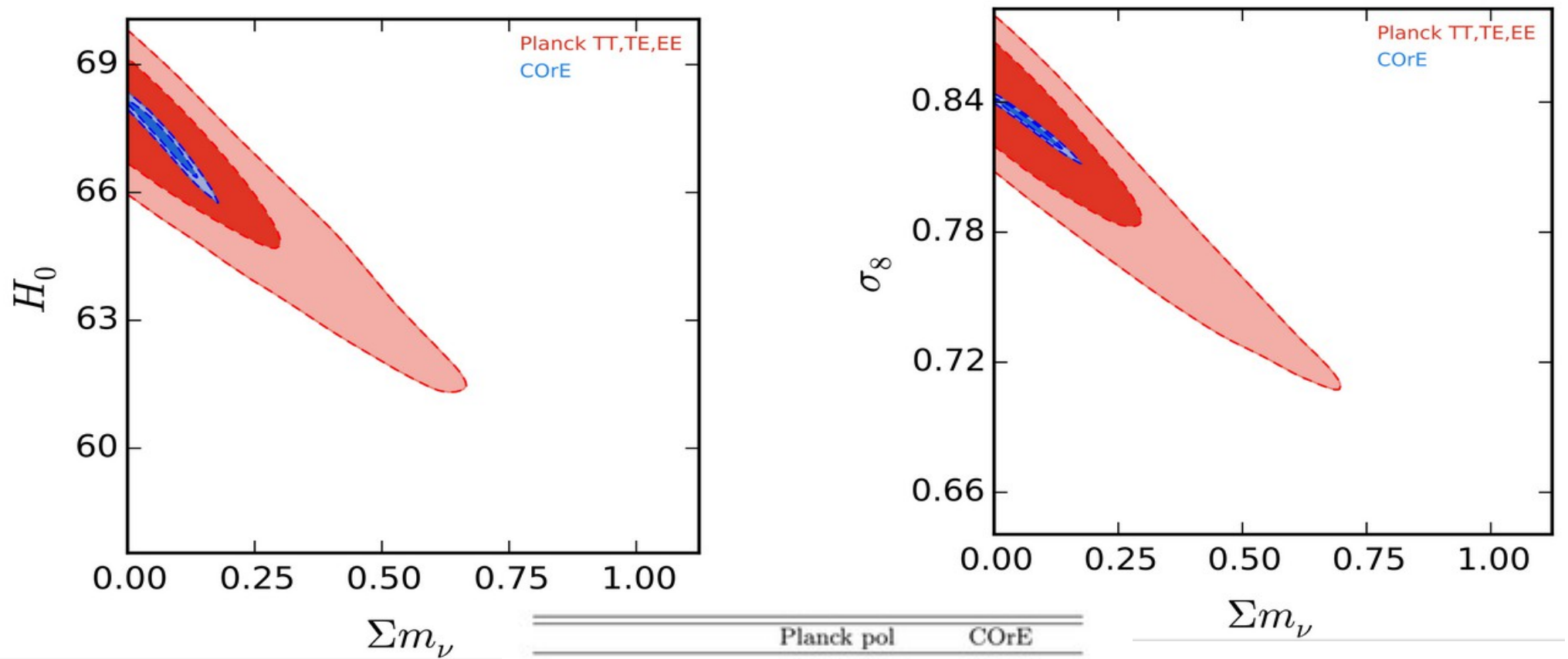
Errors are improved by a factor 5 (7 in some cases!) respect to Planck 2015.

Constraints at 68% c.l.

— Planck TT,TE,EE+lowP — COre



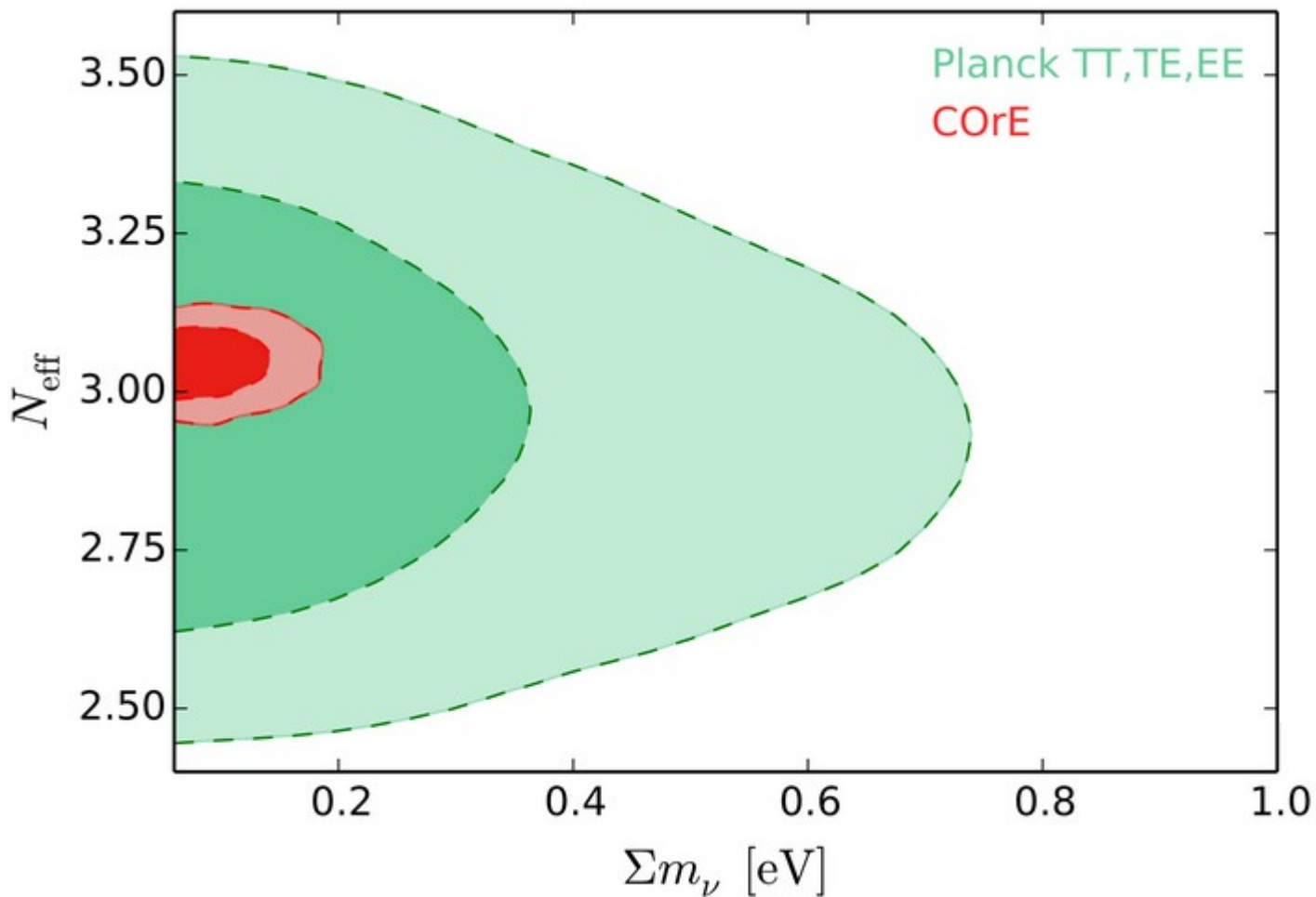
Constraints on Neutrino Mass



	Planck pol	COrE
$\Omega_c h^2$	$0.1200^{+0.0031}_{-0.0030}$	$0.1198^{+0.0011}_{-0.0010}$
Σm_ν [eV]	< 0.497	< 0.143
H_0 [Kms $^{-1}$ Mpc $^{-1}$]	$66.3^{+2.9}_{-3.8}$	$67.2^{+1.0}_{-1.1}$
σ_8	$0.811^{+0.058}_{-0.076}$	$0.829^{+0.013}_{-0.013}$
Ω_m	$0.329^{+0.052}_{-0.039}$	$0.316^{+0.014}_{-0.013}$
τ	$0.081^{+0.033}_{-0.034}$	$0.0602^{+0.0041}_{-0.0040}$

Constraints at 95% c.l.

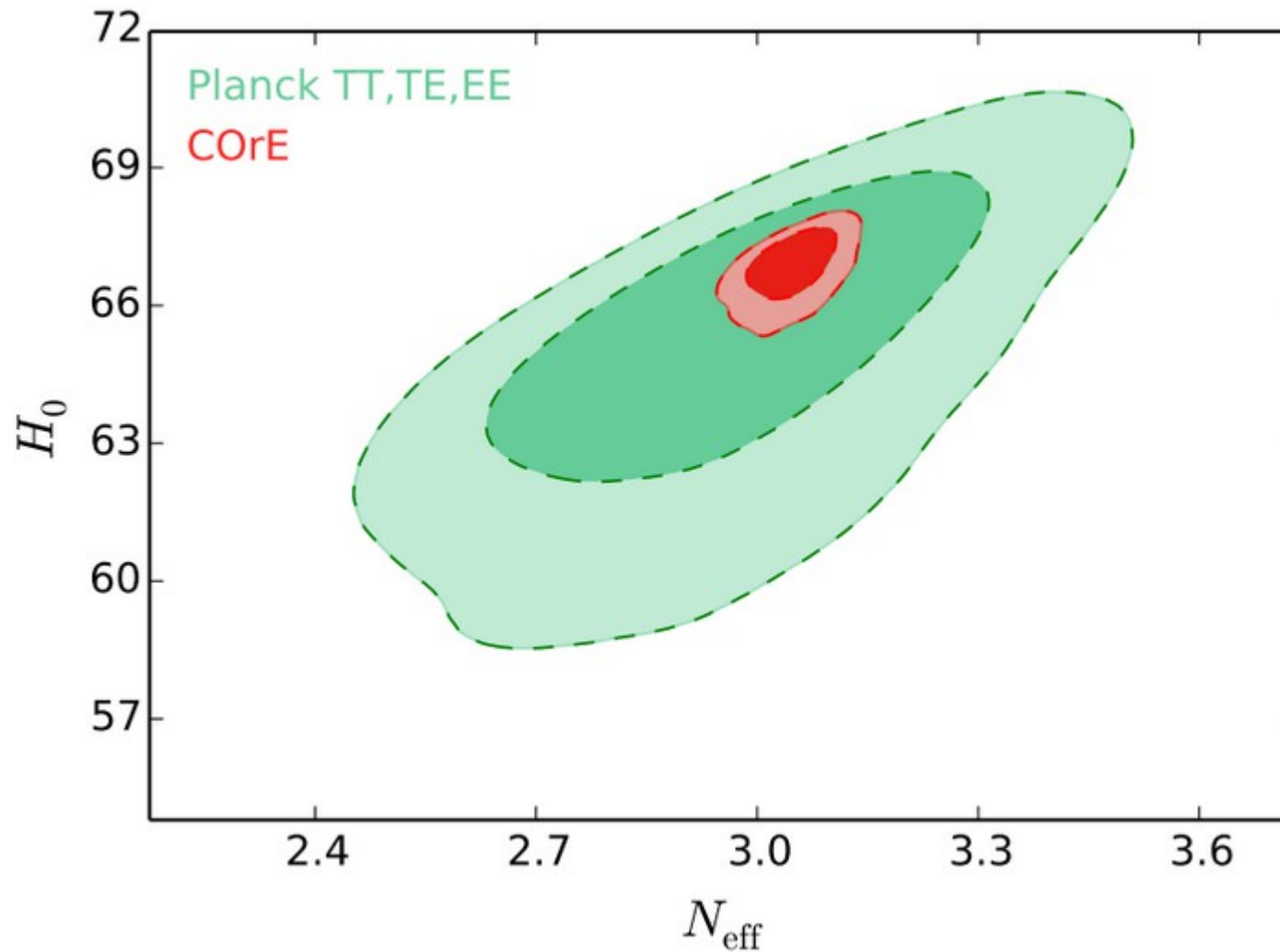
Constraints on Neutrino Masses + N_{eff}



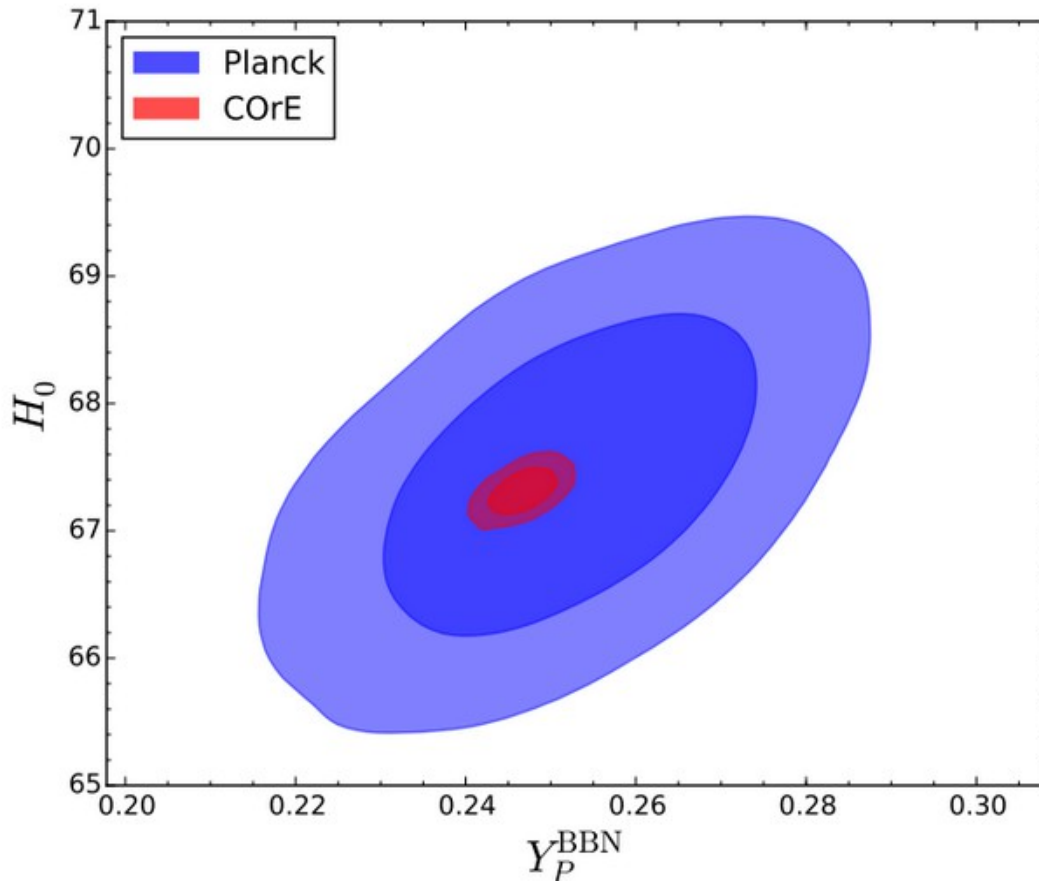
	COrE
$\Omega_c h^2$	$0.1201^{+0.0015}_{-0.0014}$
Σm_ν [eV]	< 0.163
N_{eff}	$3.046^{+0.073}_{-0.076}$
H_0 [km s ⁻¹ Mpc ⁻¹]	$66.8^{+0.99}_{-1.1}$
σ_8	$0.825^{+0.012}_{-0.012}$
Ω_m	$0.321^{+0.013}_{-0.011}$
τ	$0.060^{+0.004}_{-0.004}$

Constraints at 95% c.l.

Constraints on Neutrino Masses + N_{eff}



Constraints on Helium abundance (and neutron lifetime)



Dataset	Y_p^{BBN}	τ_n [s]
Planck TT, TE, EE	0.252 ± 0.014	907 ± 69
COre	0.2467 ± 0.0025	880 ± 12

Constraints at 68% c.l.

Conclusions

- Planck provided the best CMB measurements to date but...
- ...there is still space for a significant improvement !
- A cosmic variance limited experiment as CORE++ could improve current constraints by a factor 5-7.
- Significant impact on neutrino mass, number, BBN.
- Foregrounds could be an issue but they could be removed with sufficient coverage on frequency (this could be a strong issue especially for ground based experiments as StageIV).