

The path to a neutrino mass sum measurement from cosmology

What can we expect from future surveys?

Mock CMB surveys

Temperature, polarisation, lensing

1. Planck
2. LiteBIRD
3. CMB-S4 alone
4. CMB-S4 with LiteBIRD
5. CMB-S4 with CORE-M5
6. CORE-M5
7. PICO

Mock large-scale structure surveys

1. DESI baryon acoustic oscillations
2. Euclid cosmic shear, galaxy clustering
3. SKA 21cm intensity mapping
4. independent τ_{reio} measurement

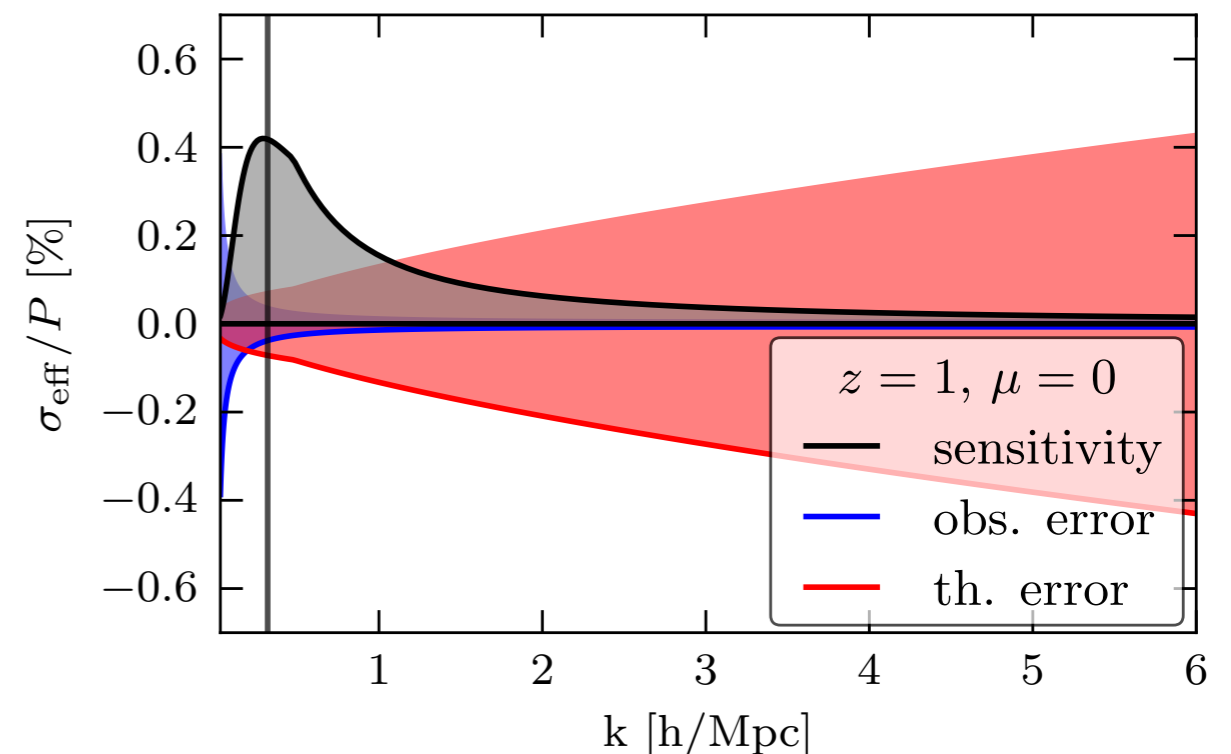
Four models

Common non-linear approach:

> Non-linear cut-off e.g. $k_{\text{max}} = 0.2 \text{ h/Mpc}$

Our non-linear method:

> Theoretical uncertainty due to non-linear modelling



TB, Hooper, Archidiacono, Lesgourgues,
and Sprenger 1808.05955

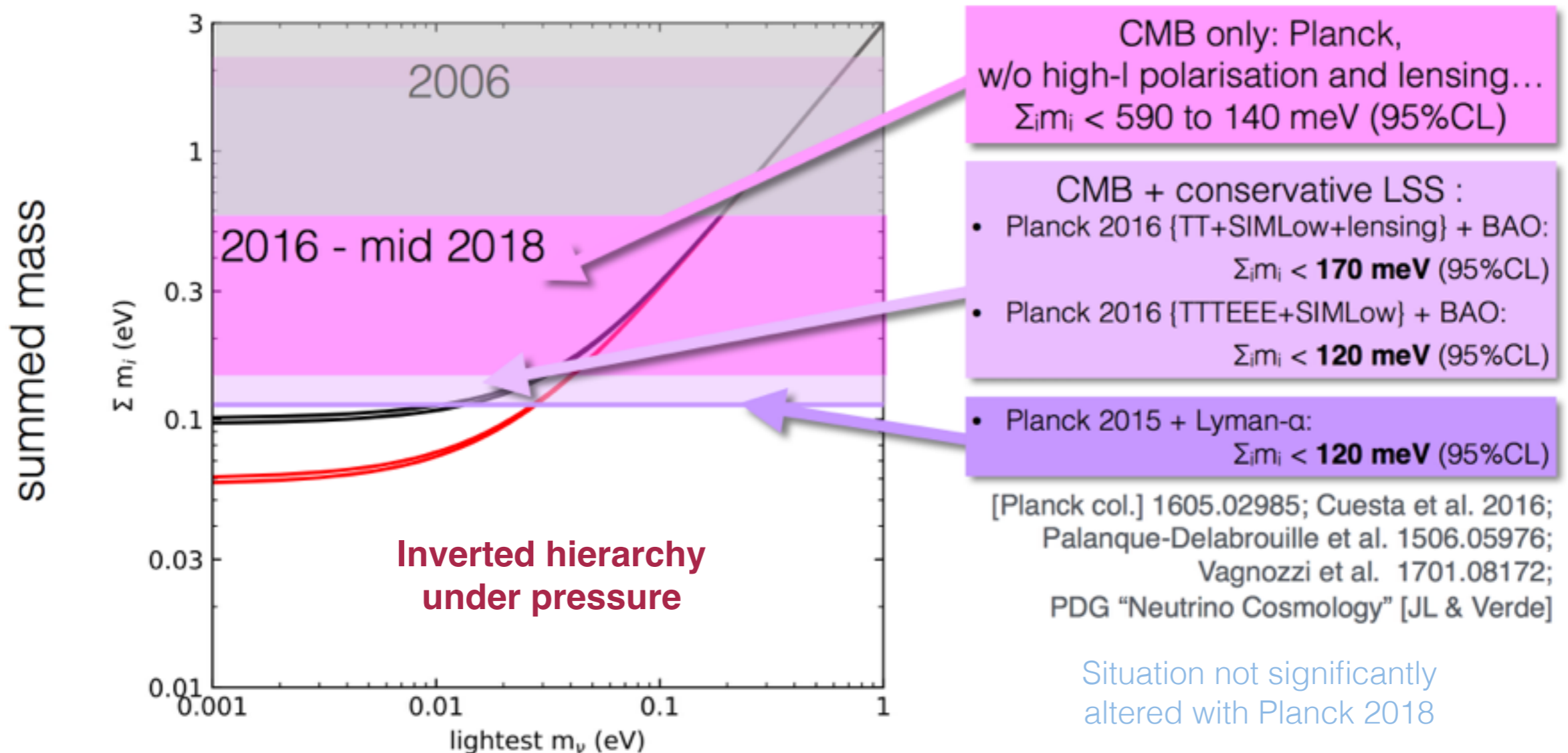
Sprenger, Archidiacono, TB, Clesse,
and Lesgourgues 1801.08331

The path to a neutrino mass sum measurement from cosmology

Brief recap of current status of neutrino cosmology.

For more details see e.g. recent review Lattanzi & Gerbino 1712.07109

95%CL upper bounds on $\Sigma_i m_i$ for 7 parameters

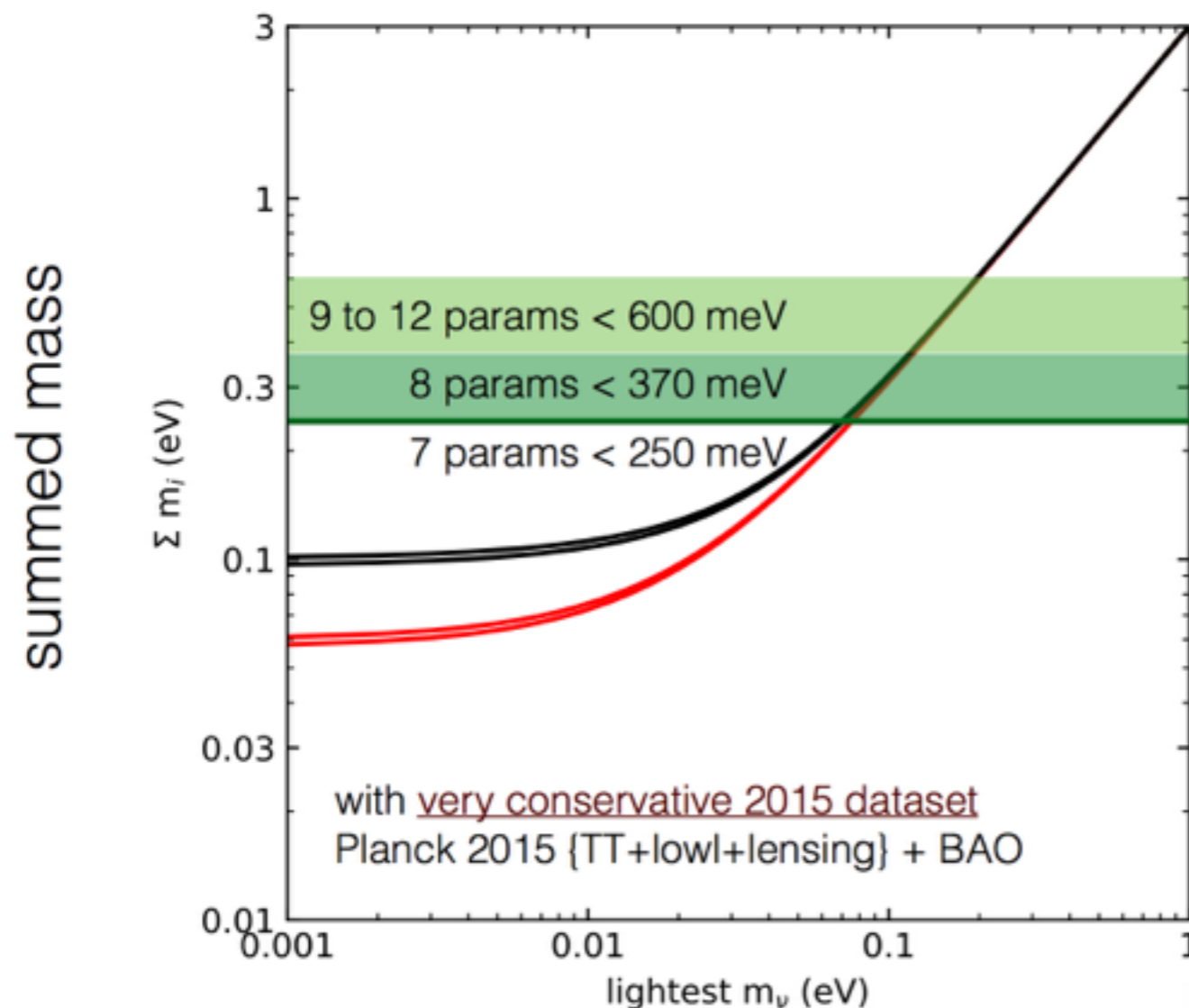


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95%CL upper bounds on $\Sigma_i m_i$ beyond 7 parameters



Usual suspects:

- extra massless relics ←
- extra light relics
- spatial curvature
- simplest dynamical DE ←
- primordial GWs
- primordial tilt running

Even more freedom in:

- modified Einstein Gravity
- interactions in DM sector

[Planck col.] 1502.01589; Di Valentino et al. 1507.06646