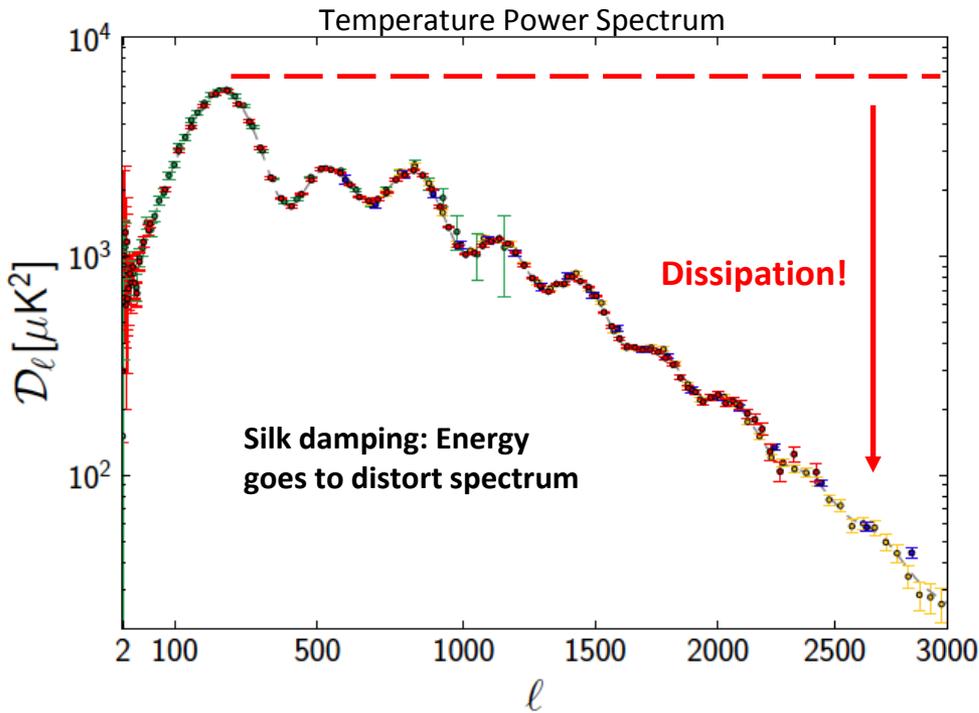


Spectral Distortions and Inflation



Energy release from dissipation of primordial density perturbations

$$\text{Chemical potential } \mu = 1.4 \frac{\Delta E}{E}$$

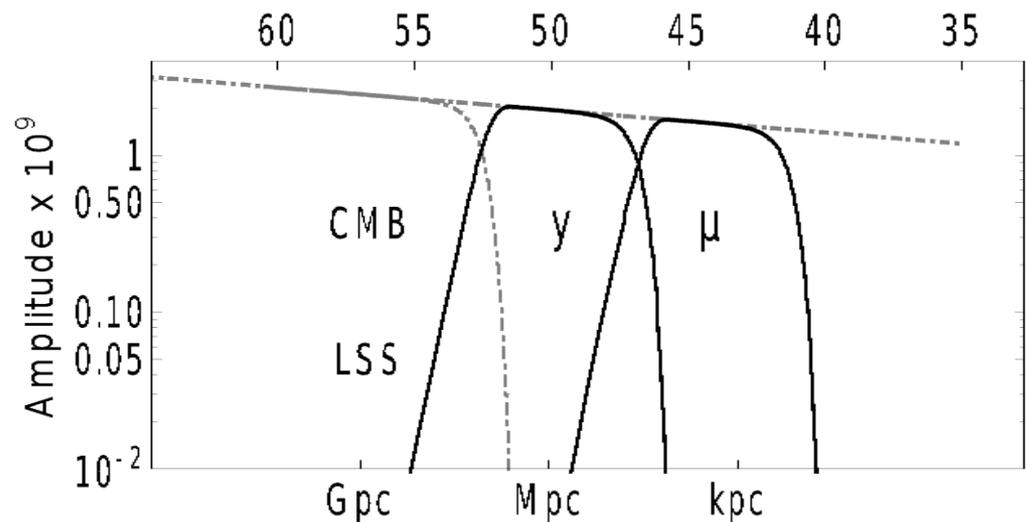
Λ CDM predicts $\mu \sim 1-2 \times 10^{-8}$

Factor of 1000 below current upper limits
But ... Potentially observable (PIXIE, PRISM)

Spectral distortions extend tests of inflation by 4 orders of magnitude in physical scale

- Test inflation beyond CMB TT or LSS
 - x10 more e-folds
 - x10⁶ more modes
- Spectral index and running

Test inflation at solar-mass scales!



Complementarity

Things that space missions do very well

- Measurements across entire electromagnetic spectrum
 - Foregrounds outside atmospheric windows
 - Ancillary science
- Exceptionally stable observing environment
 - Measure largest angular scales
 - Calibration stability
- Minimal constraints on pointing / roll
 - Systematic error control



Things that ground-based missions do very well

- Large physical size for collecting optics
 - Small angular scales
 - Low-frequency foregrounds
- Multiple instruments / facilities
 - Deep integrations
 - Cross-check vs technologies, observing modes
- Incremental upgrades to instruments / facilities
 - Cutting-edge technologies & development
 - Robust reaction