PICO: science beyond LCDM (+ r)

1) Specifically, inflation. For scalars only, beyond $\{A_s, n_s\}$

-running of spectral index, i.e. $\partial \log n_s / \partial \log k$

-statistics beyond 2-point function, i.e. $f_{\rm NL}$

-isocurvature, features, isotropy, ….

2) Assuming measurement of r

-scale dependence of tensors, i.e. n_t and

$$r = -8 n_t$$

-statistics beyond 2-point function, i.e. $f_{\rm NL}^{\rm tens}$

—> are measured gravitational waves sourced from vacuum or not? New particles S > 2? Modified GR?

-….

3) Probing cosmology with Rayleigh scattering

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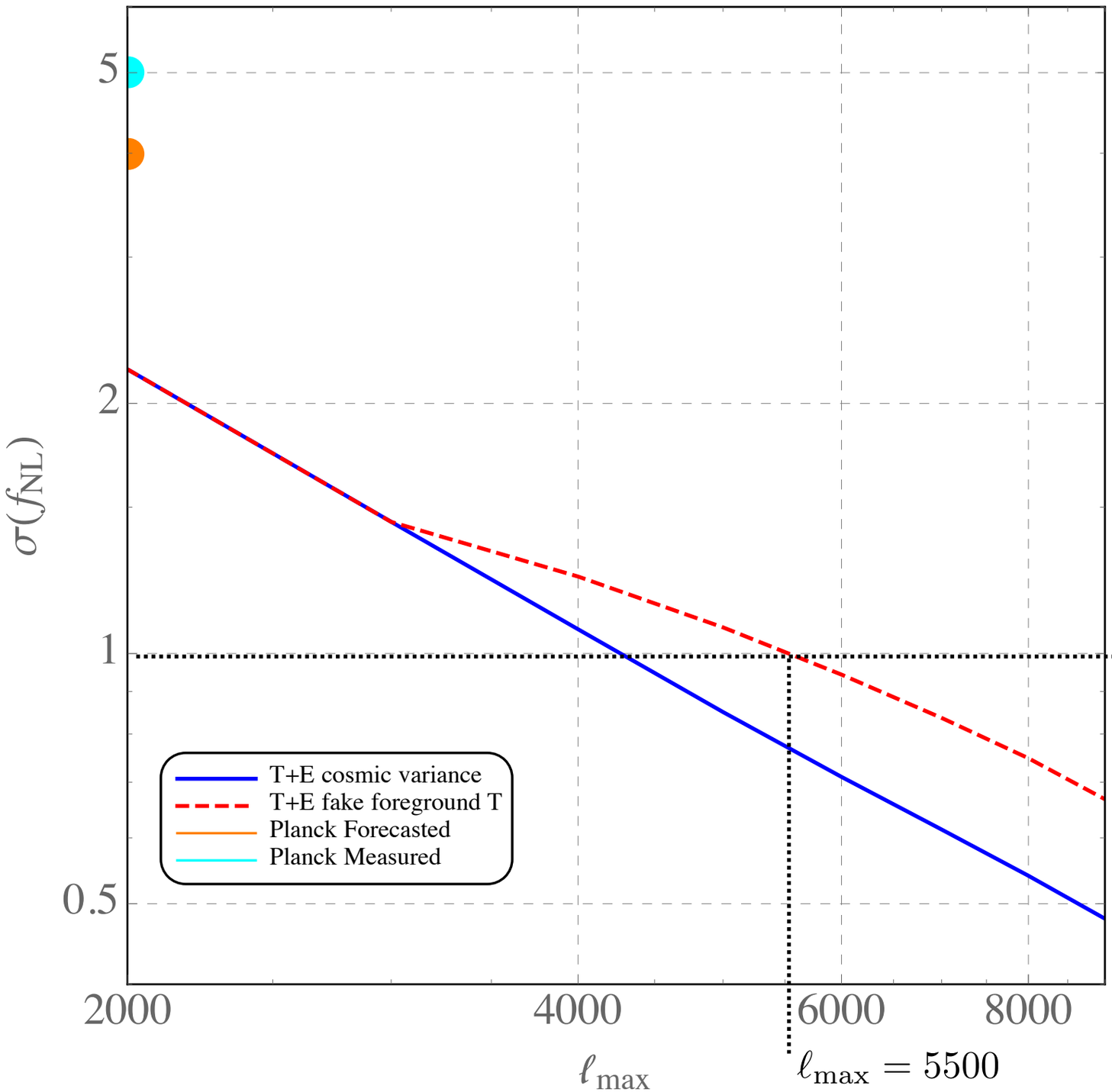
1

Scalar NGs: what is possible with the CMB?



PICO:

$\sigma_{f_{\rm NL}^{\rm local}} \sim 1.4$

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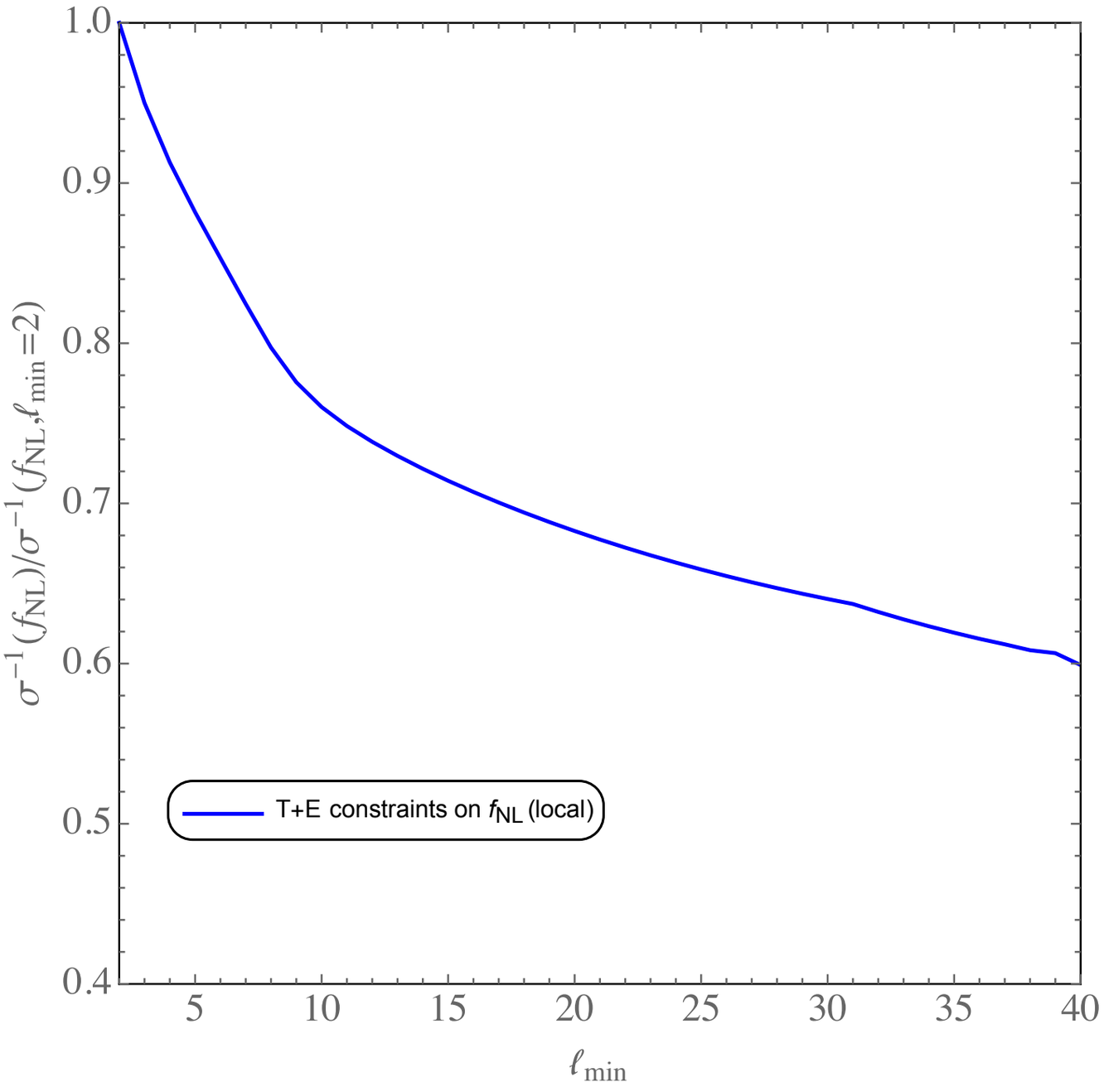
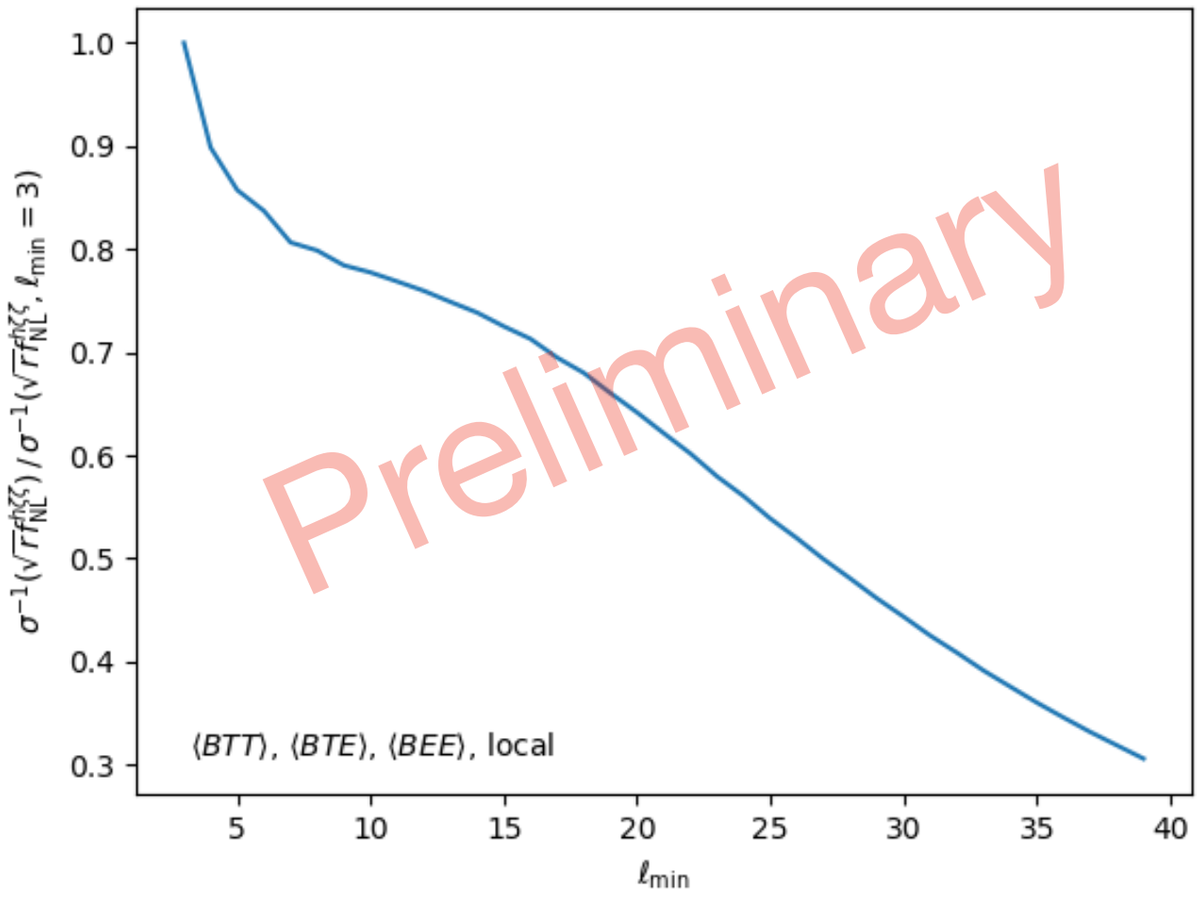
2

Scalar and tensor NGs: —> Benefit from Full Sky + large scales





credit: Adri Duivenvoorden

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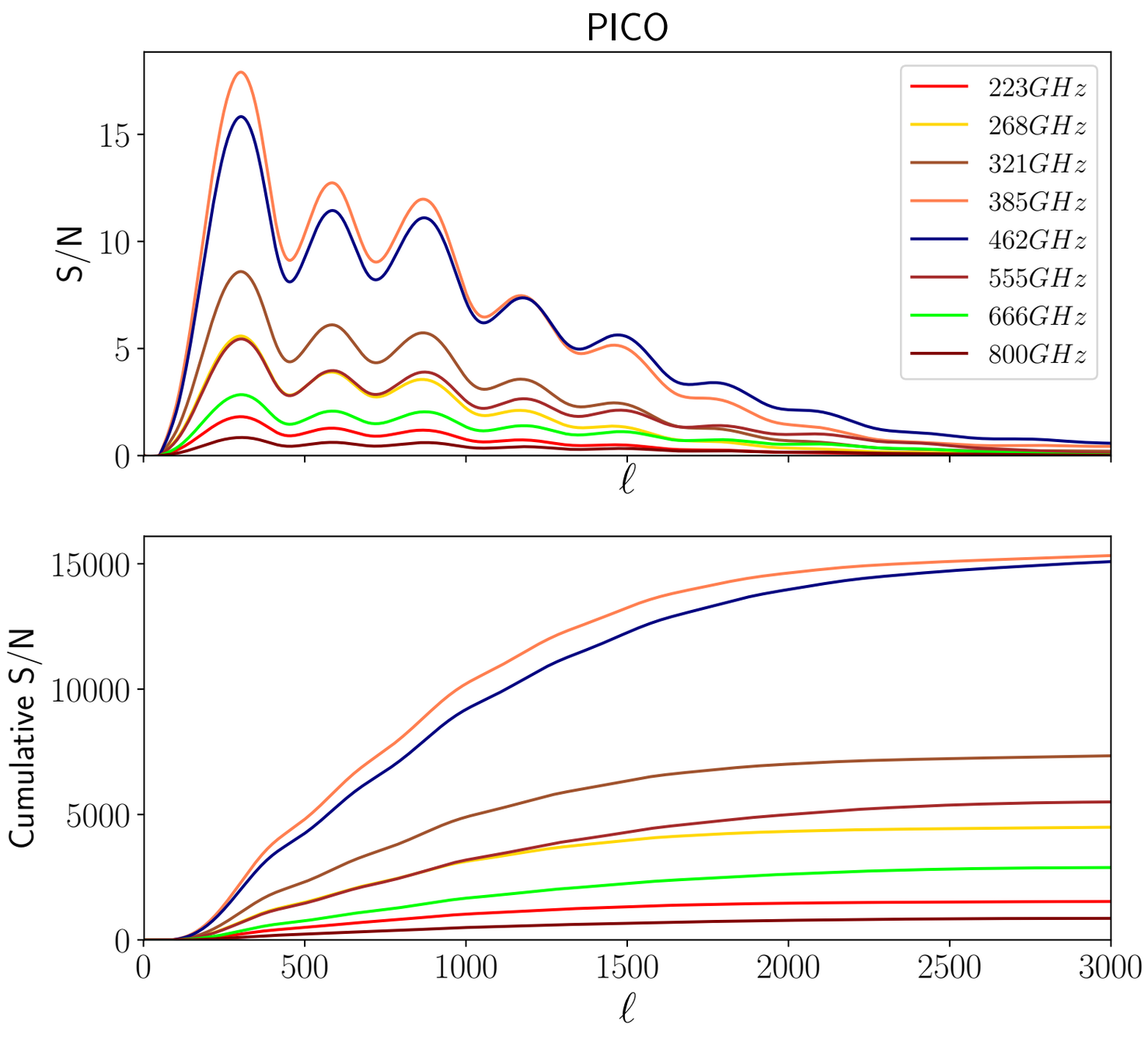
3

Rayleigh scattering and applications to cosmology

Detectability of Thomson x Rayleigh TT correlation



credit: Benjamin Beringue

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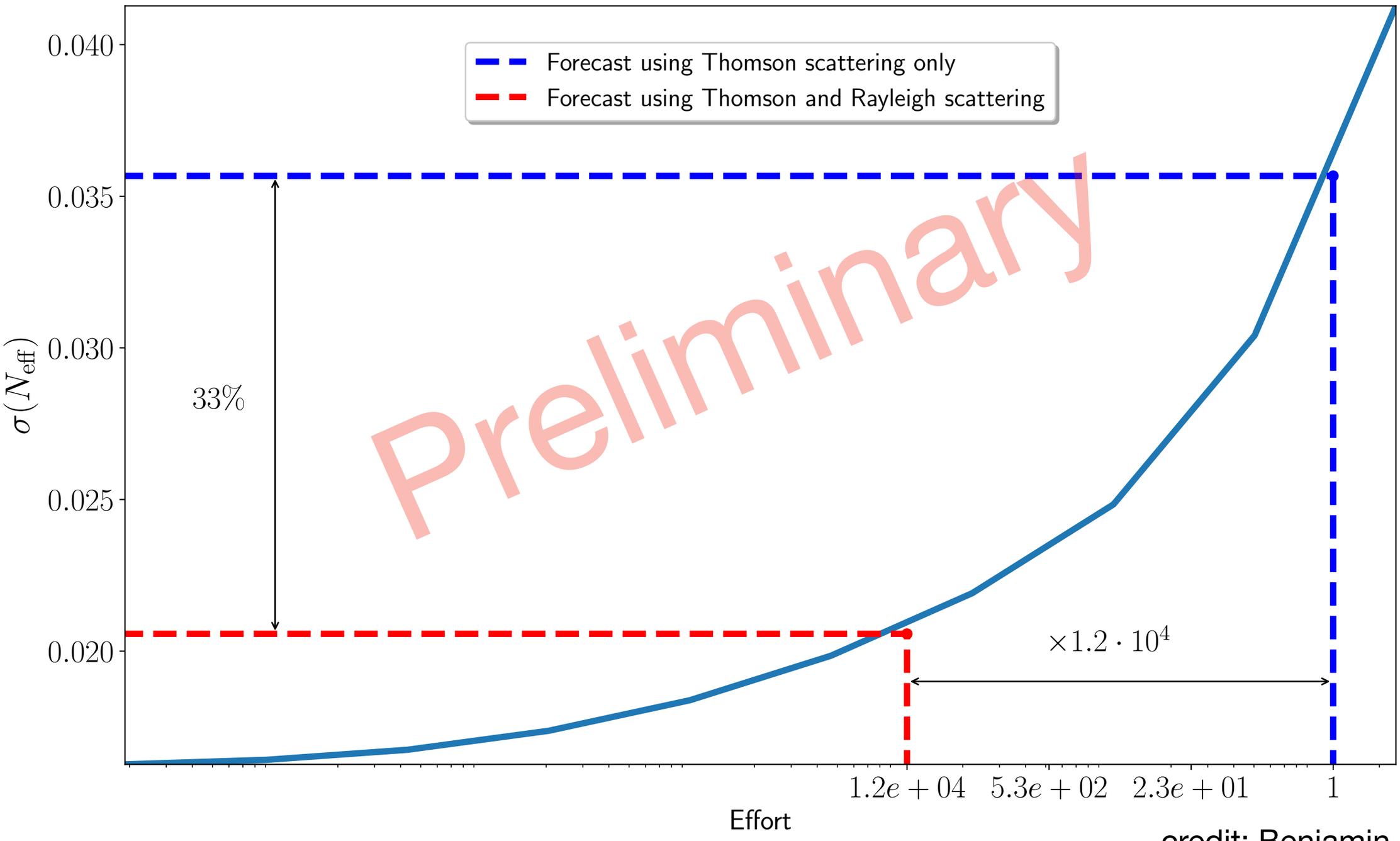
Additional plots

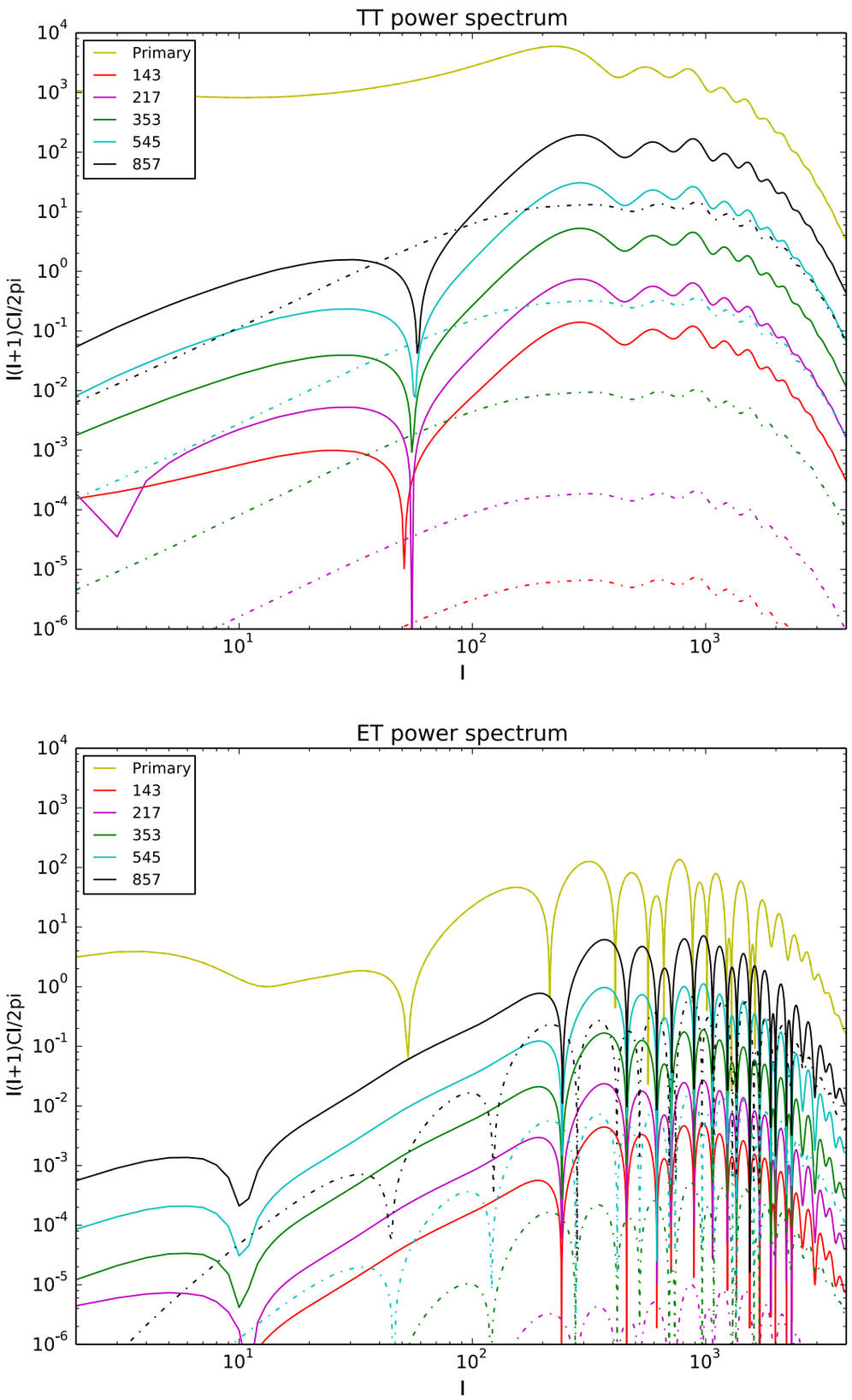
Improvement on $N_{\rm eff}$ thanks to Rayleigh scattering for PICO

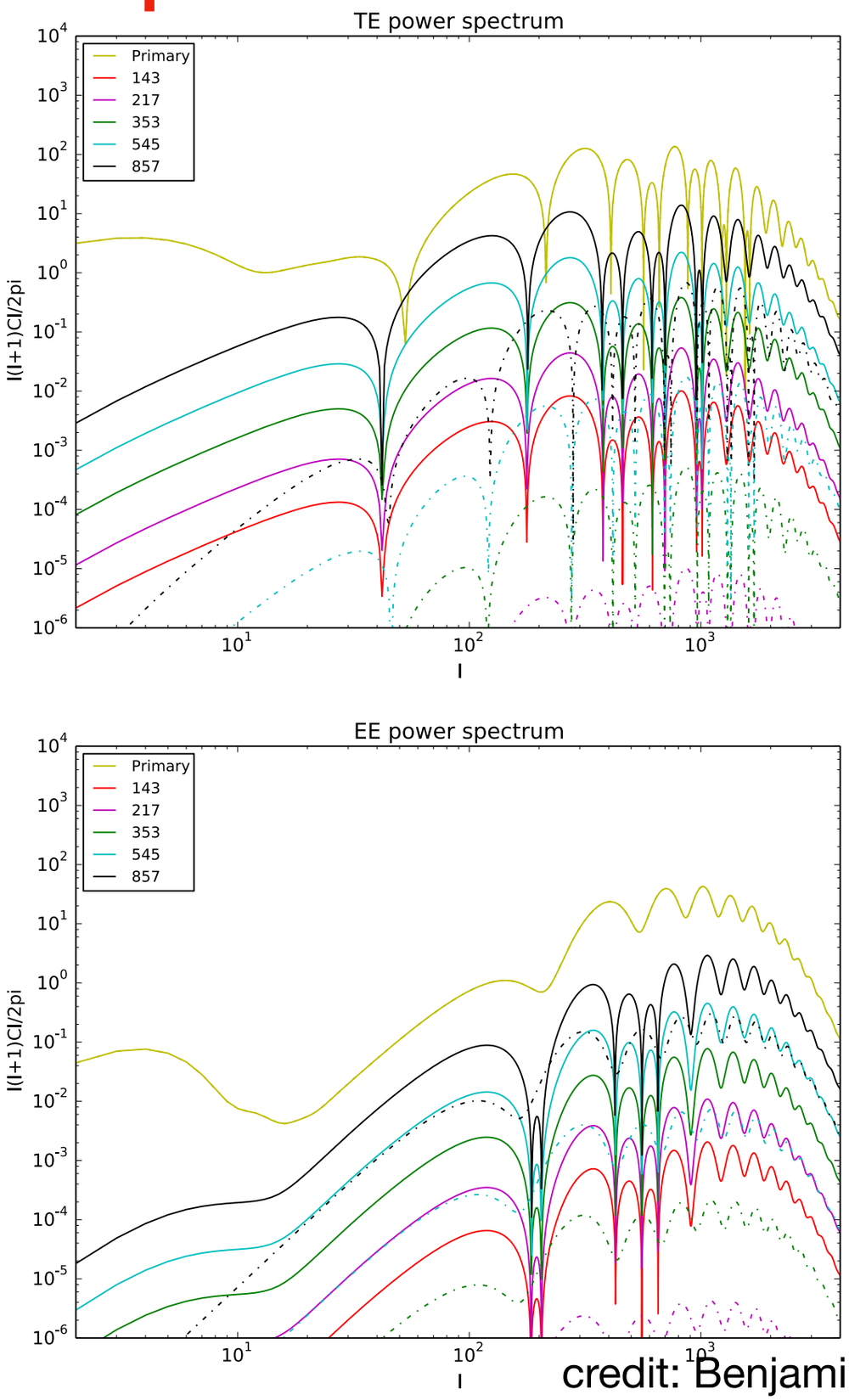


credit: Benjamin Beringue

PICO: science beyond LCDM (+ r)

Additional plots

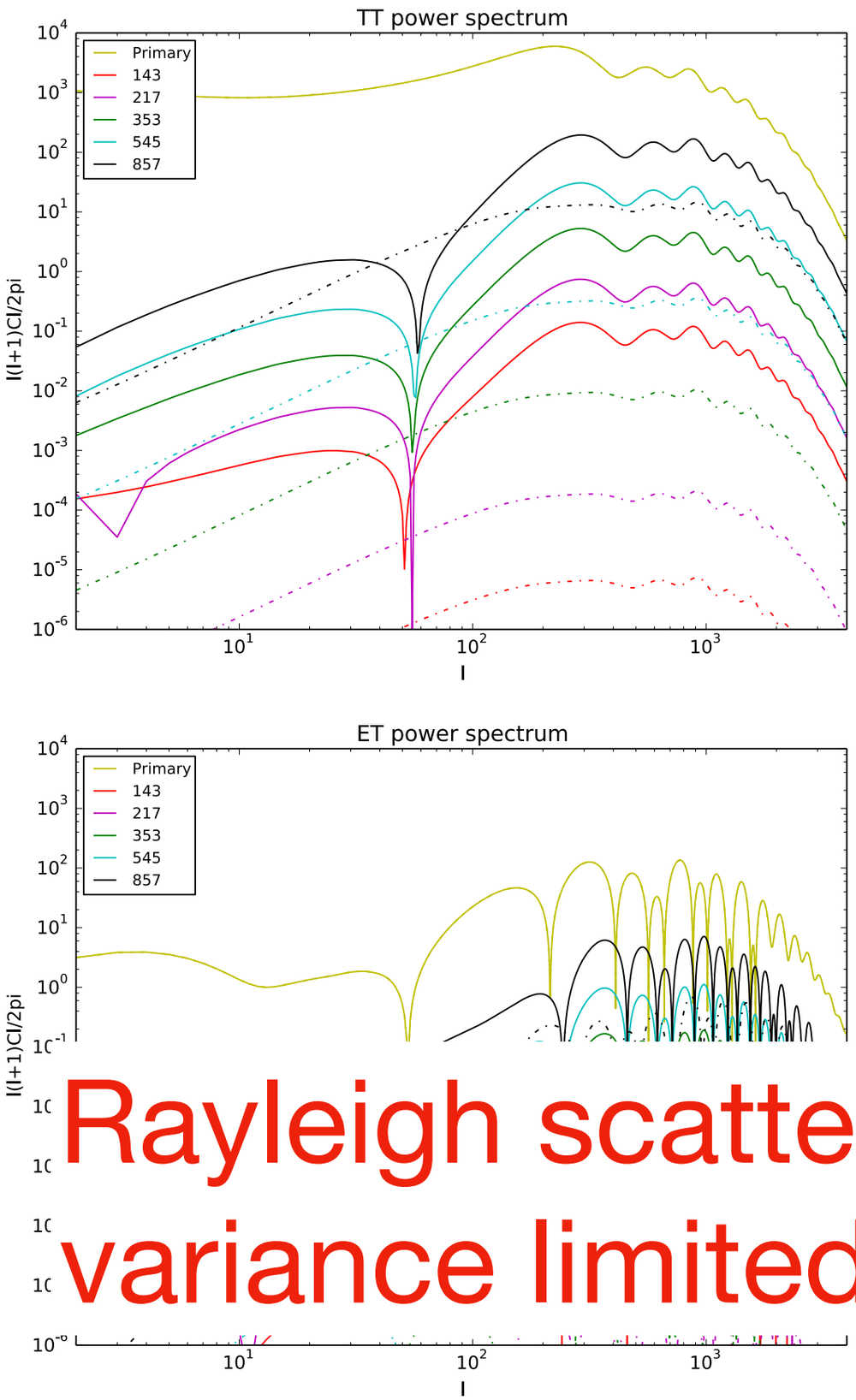


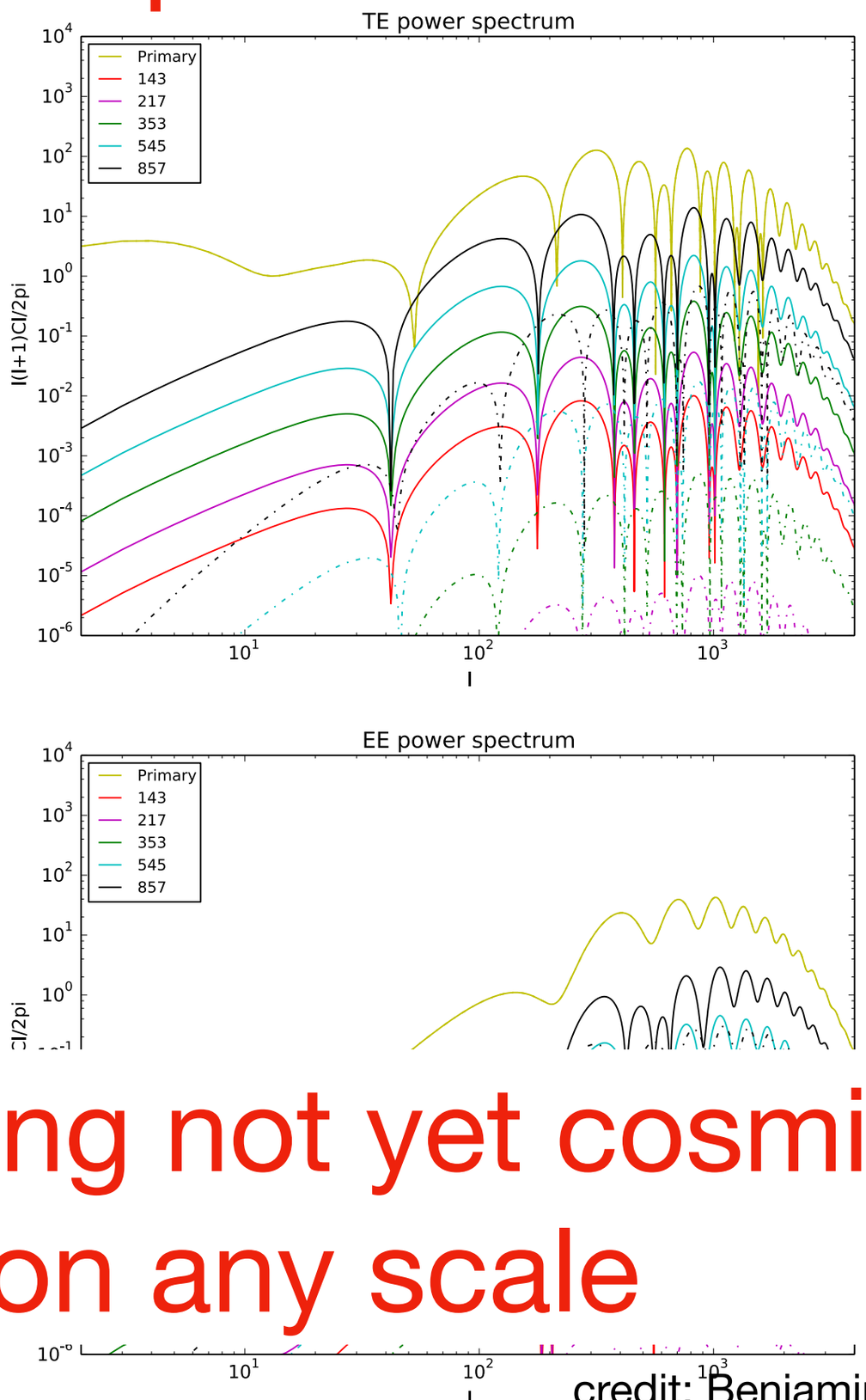


credit: Benjamin Beringue

PICO: science beyond LCDM (+ r)

Additional plots



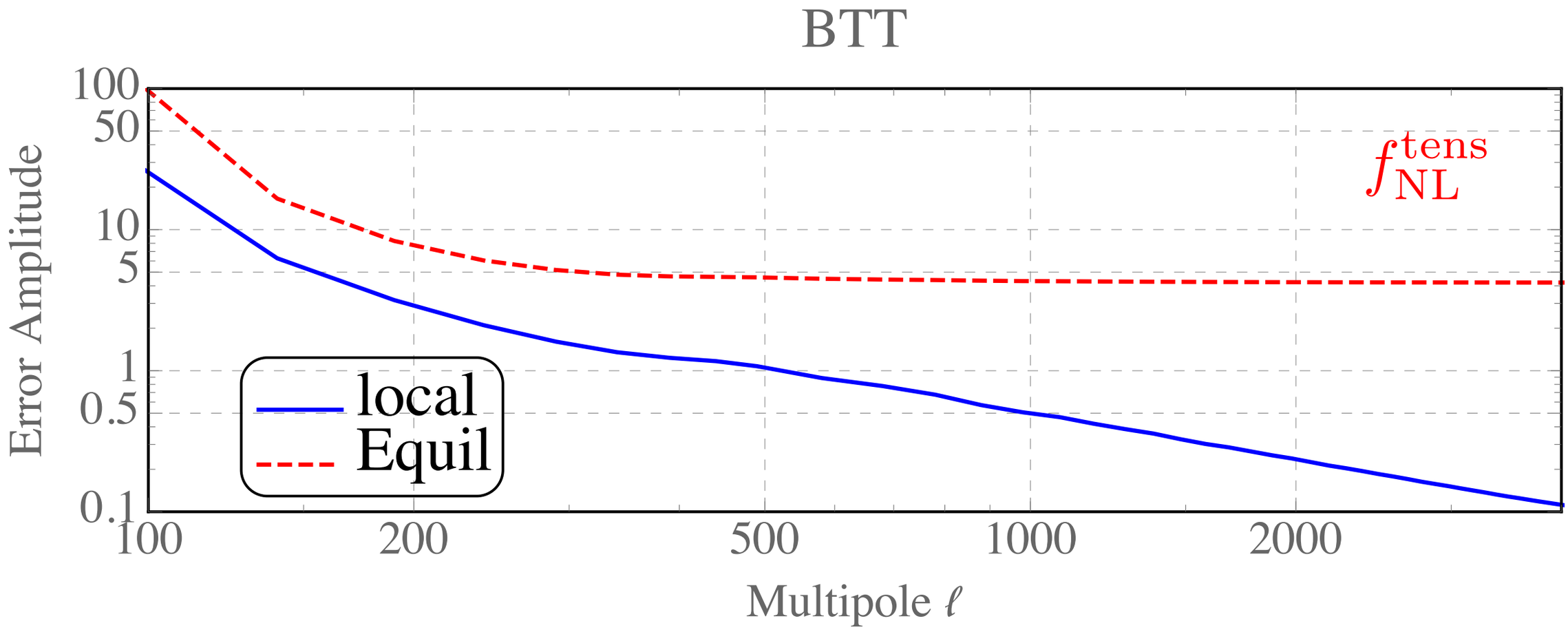


Rayleigh scattering not yet cosmic variance limited on any scale

credit: Benjamin Beringue

PICO: science beyond LCDM (+ r)

Additional plots



Caveat: curves derived in flat sky, l_min = 30