Constraining constant and tomographic coupled dark energy with low- and high-redshift probes

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Coupled Dark Energy

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- We study a class of ΛCDM model extensions: the **Coupled Quintessence model**

  - Dark energy takes on the form of a scalar field ϕ

  - Mediates interactions between dark matter particles — these particles feel a 'fifth force'

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- Here we propose a form of parametrisation for β, where it can **vary with redshift**:

$$\beta(z) = \frac{\beta_1 + \beta_n}{2} + \frac{1}{2}\sum_{i=1}^{n-1}(\beta_{i+1}-\beta_i)\tanh[s_i(z-z_i)]$$

where β_i is the amplitude of coupling in each bin, s_i is the smoothing factor and z_i is the value of the bin edge

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- We use an array of **high redshift** (CMB) and **low redshift** (BAO, SNe1a, cosmic chronometers, RSD, SHoES) data, as well as **Weak Lensing** and **Galaxy Clustering** to constrain our model
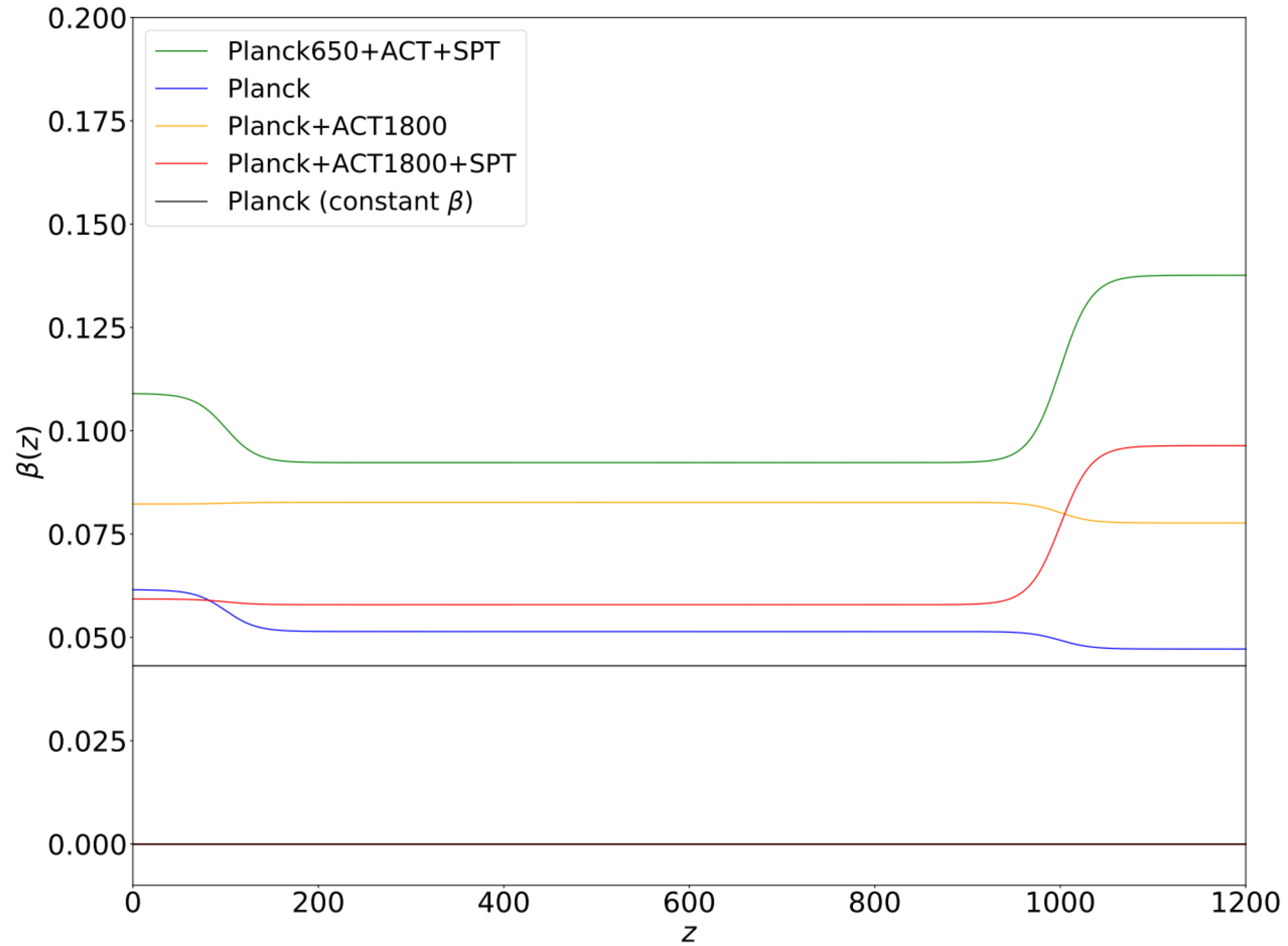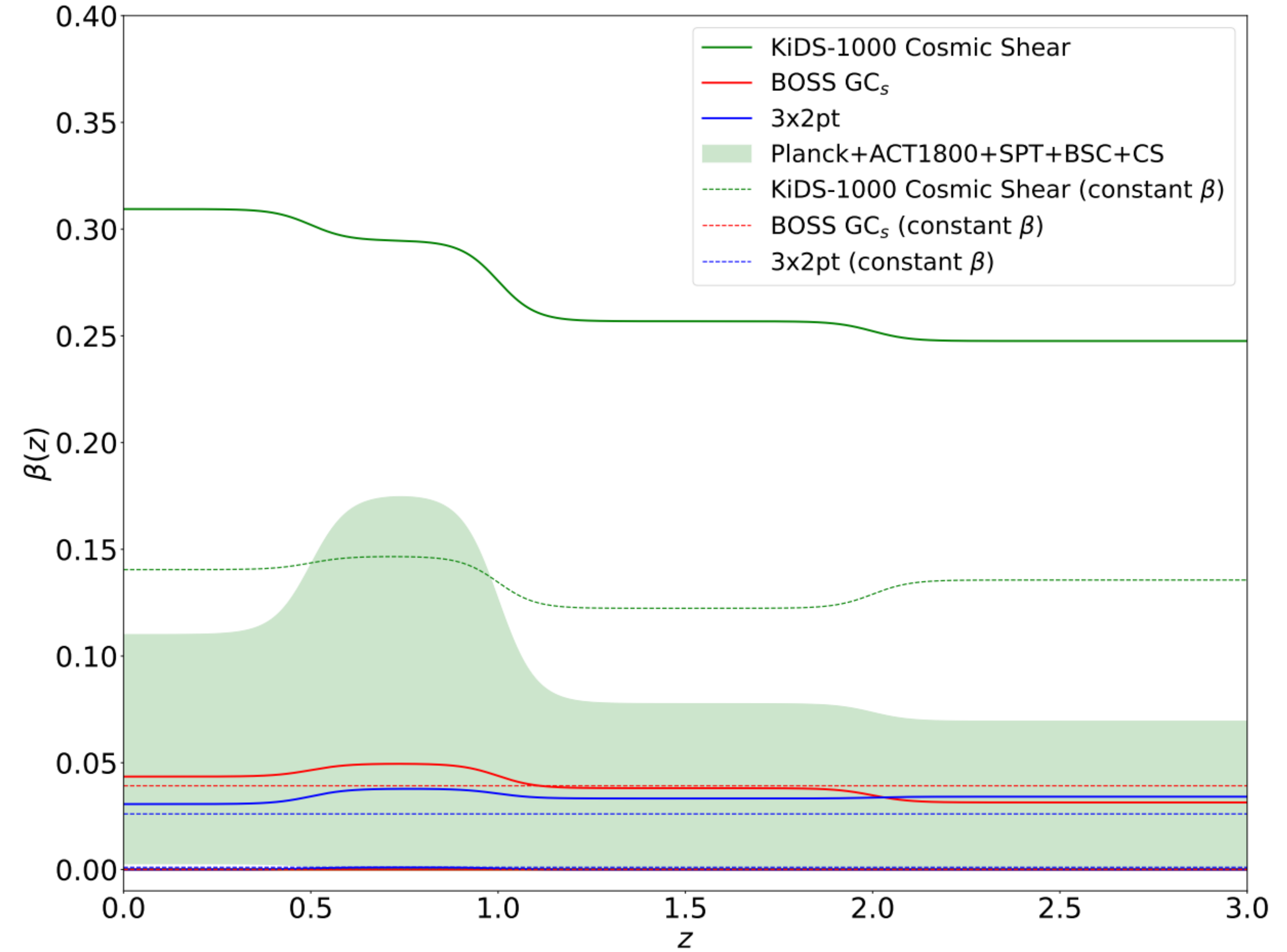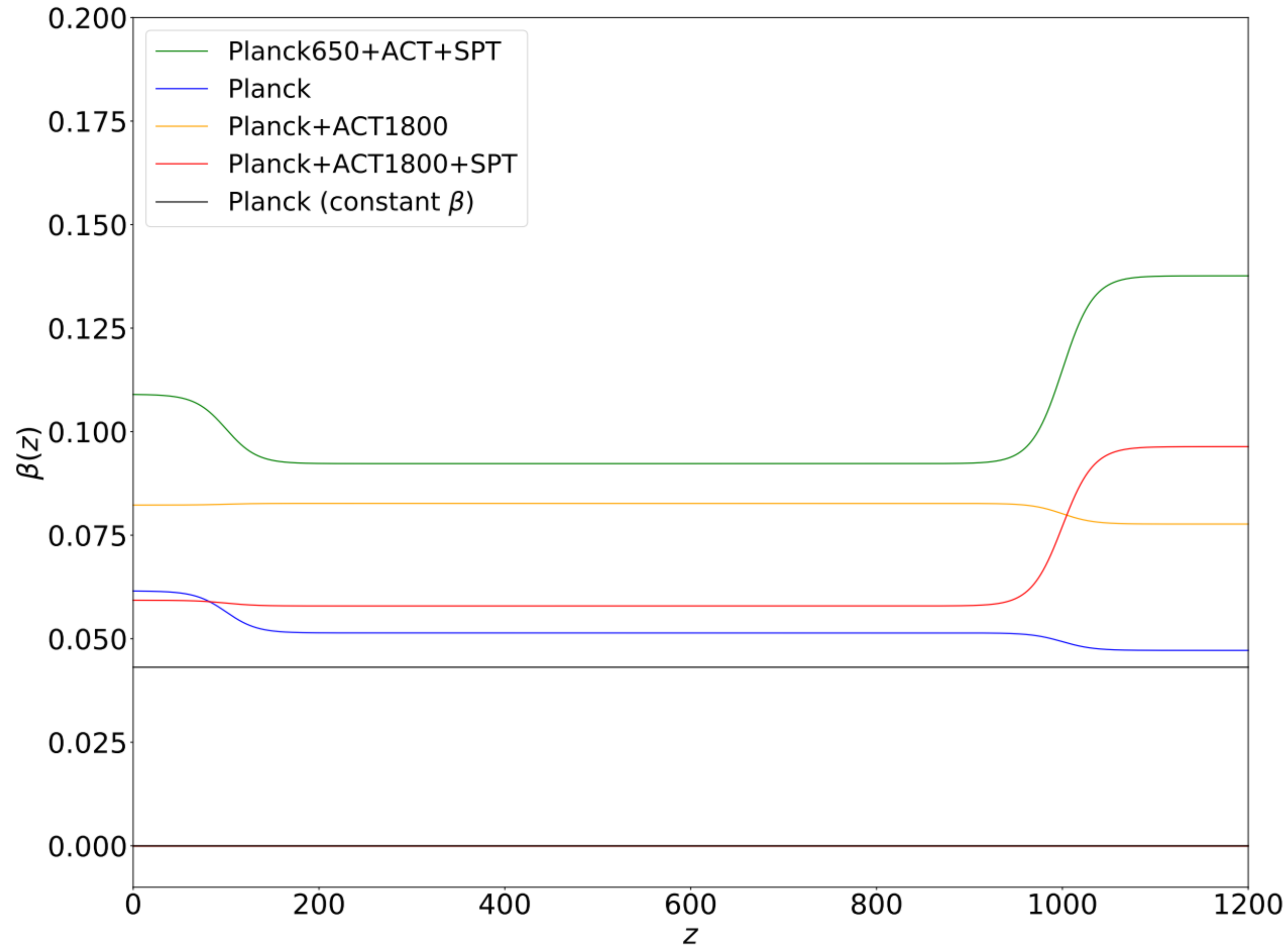
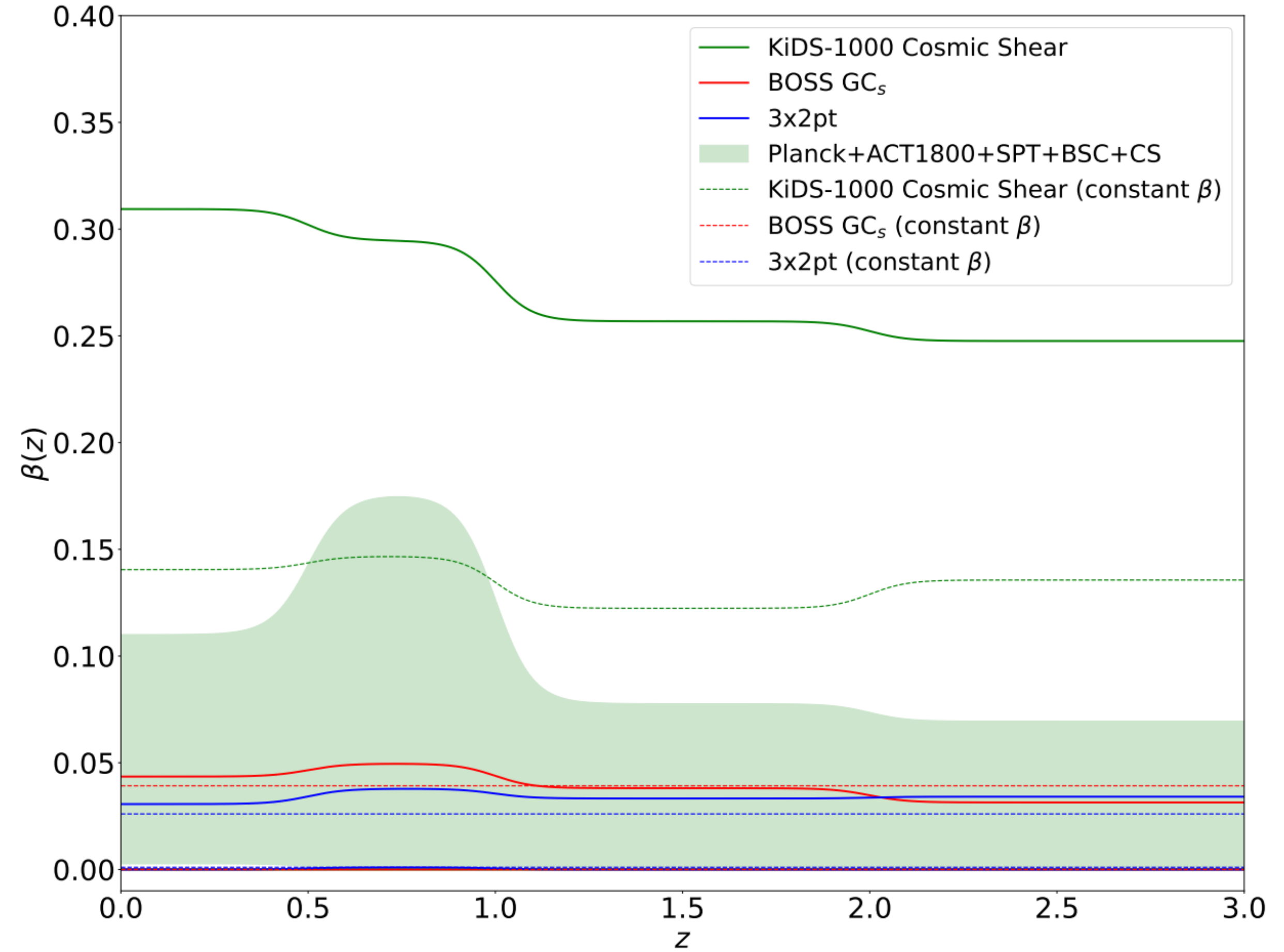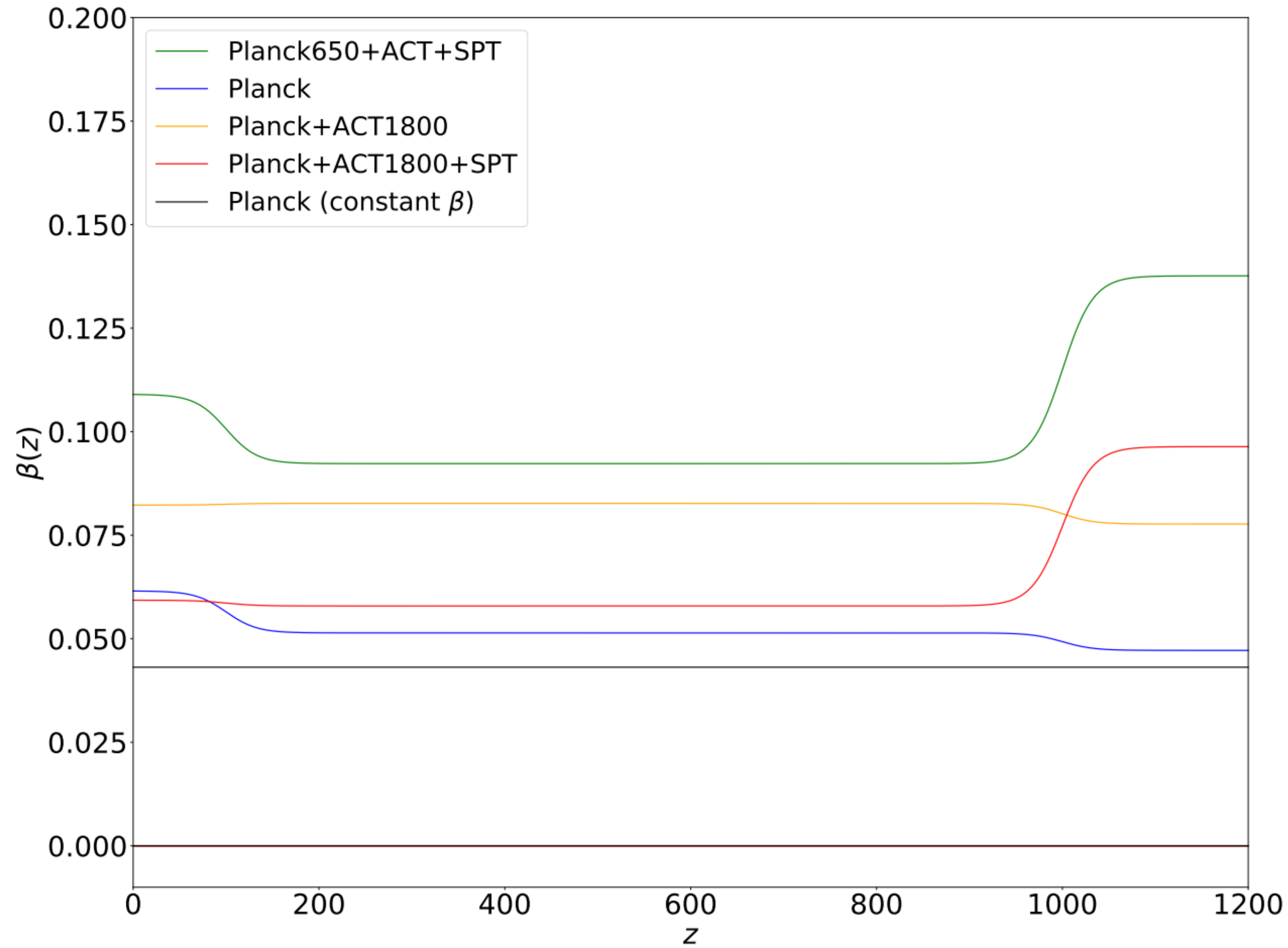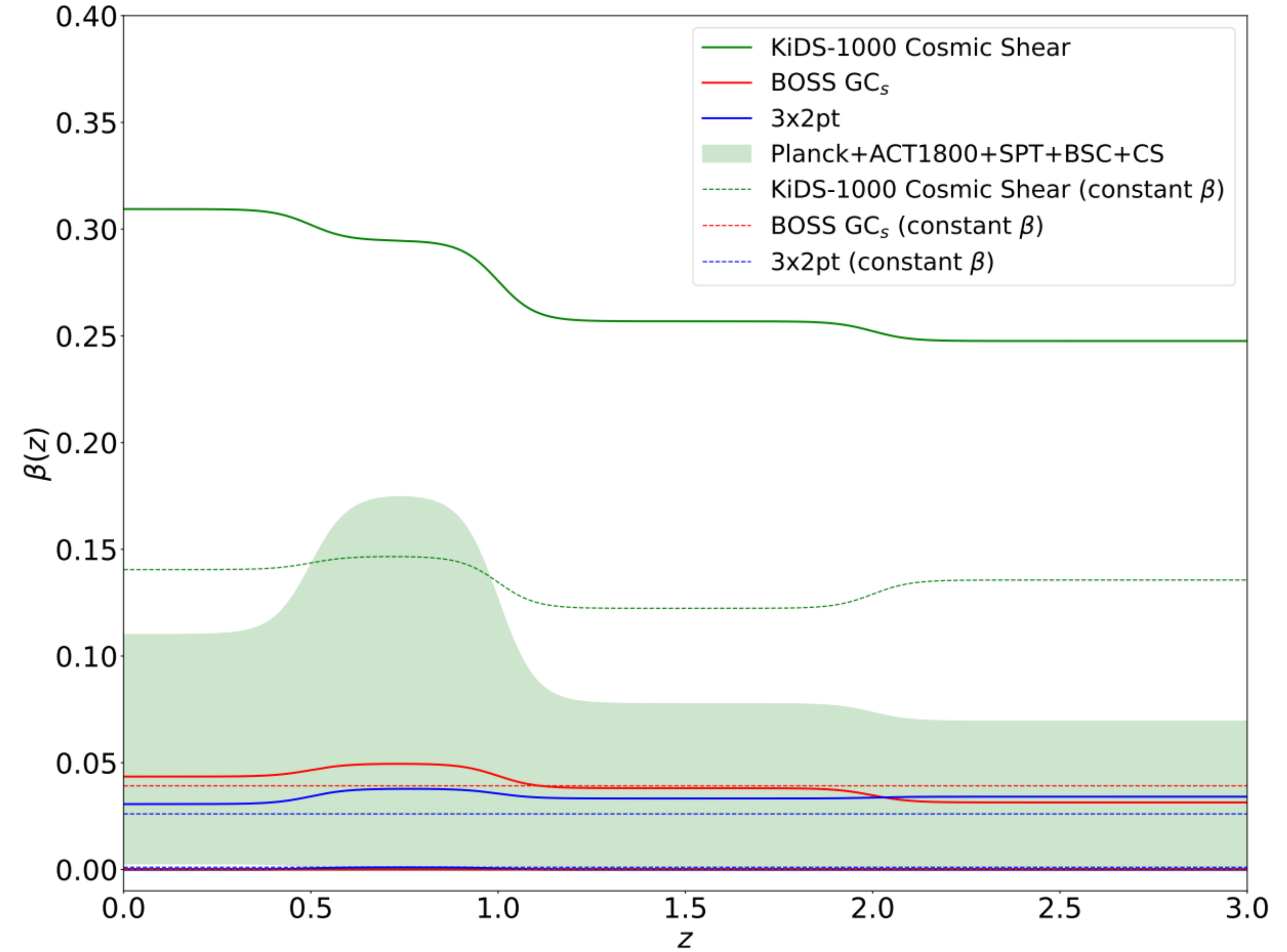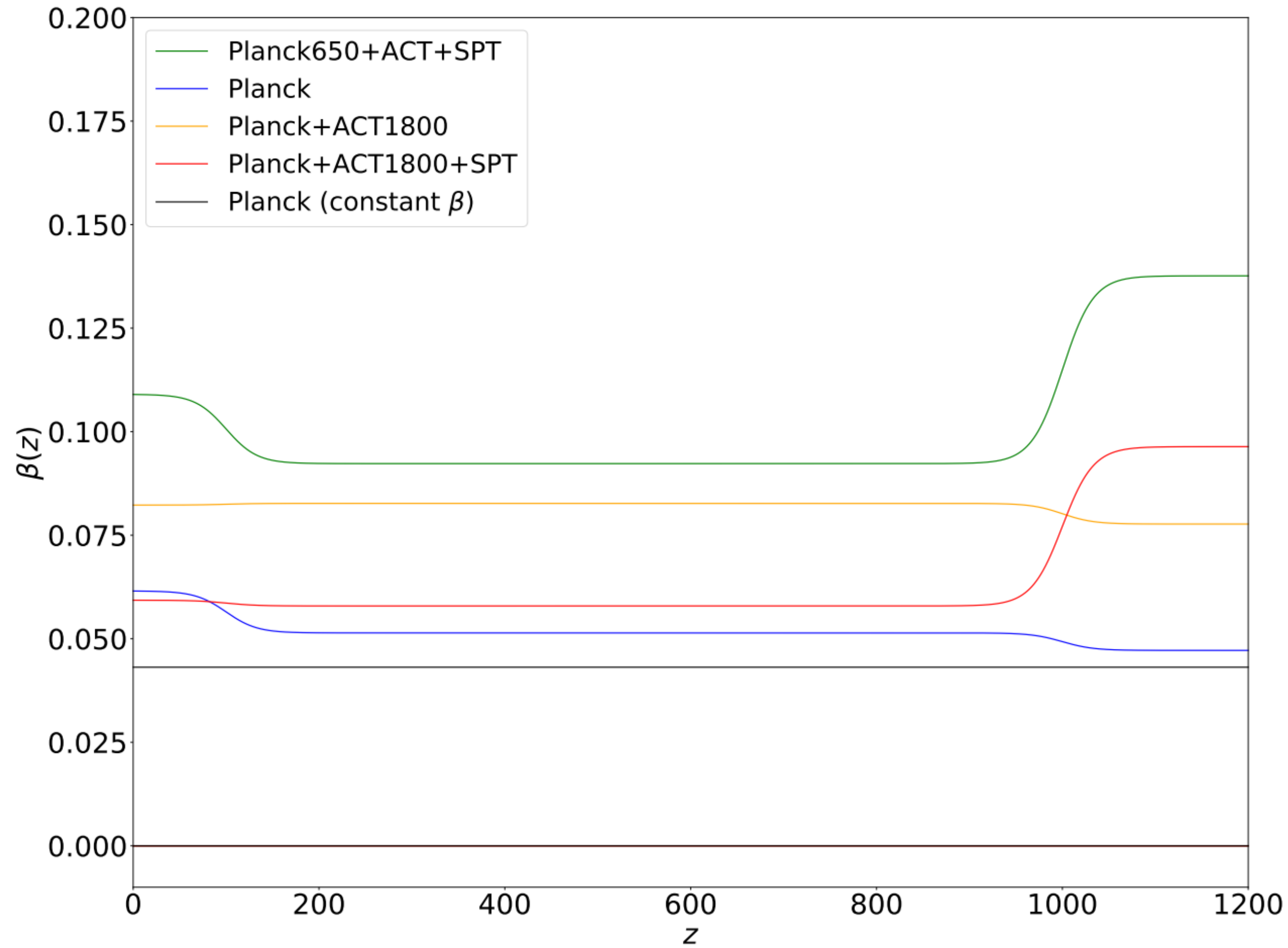# Results

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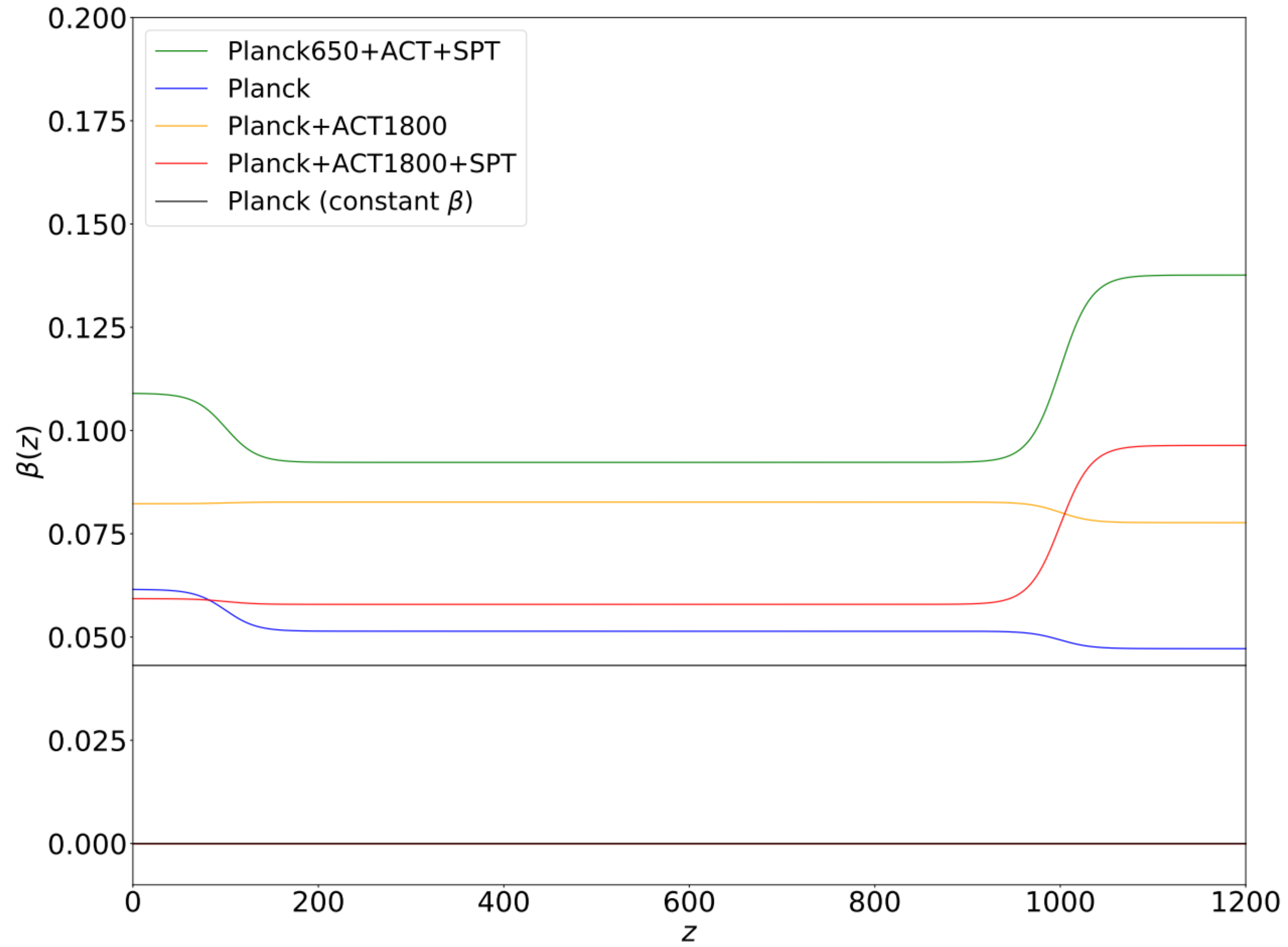
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- In a tomographic CDE framework, tension in S_8 (between 3x2pt and CMB) reduces from ~2.8σ to ~1.3σ

Thank you!