Marko Simonović

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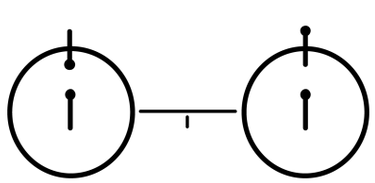
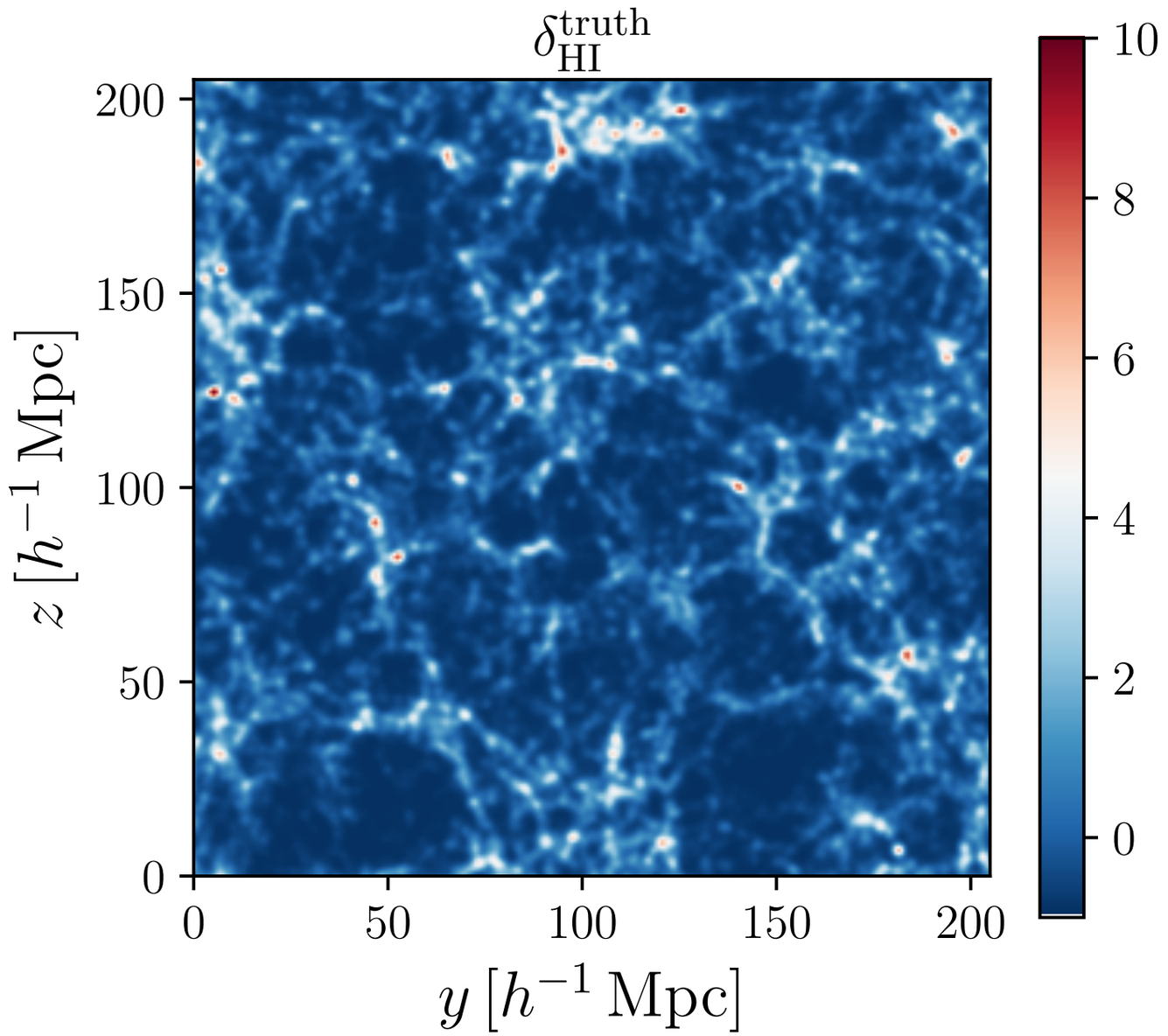
Research: QFT and EFT in cosmology
statistics of the ICs and physics of inflation
dynamics in the late universe (CMB and LSS)
novel observables and methods for data analysis

IllustrisTNG — a hydrodynamical simulation





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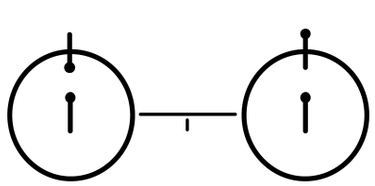
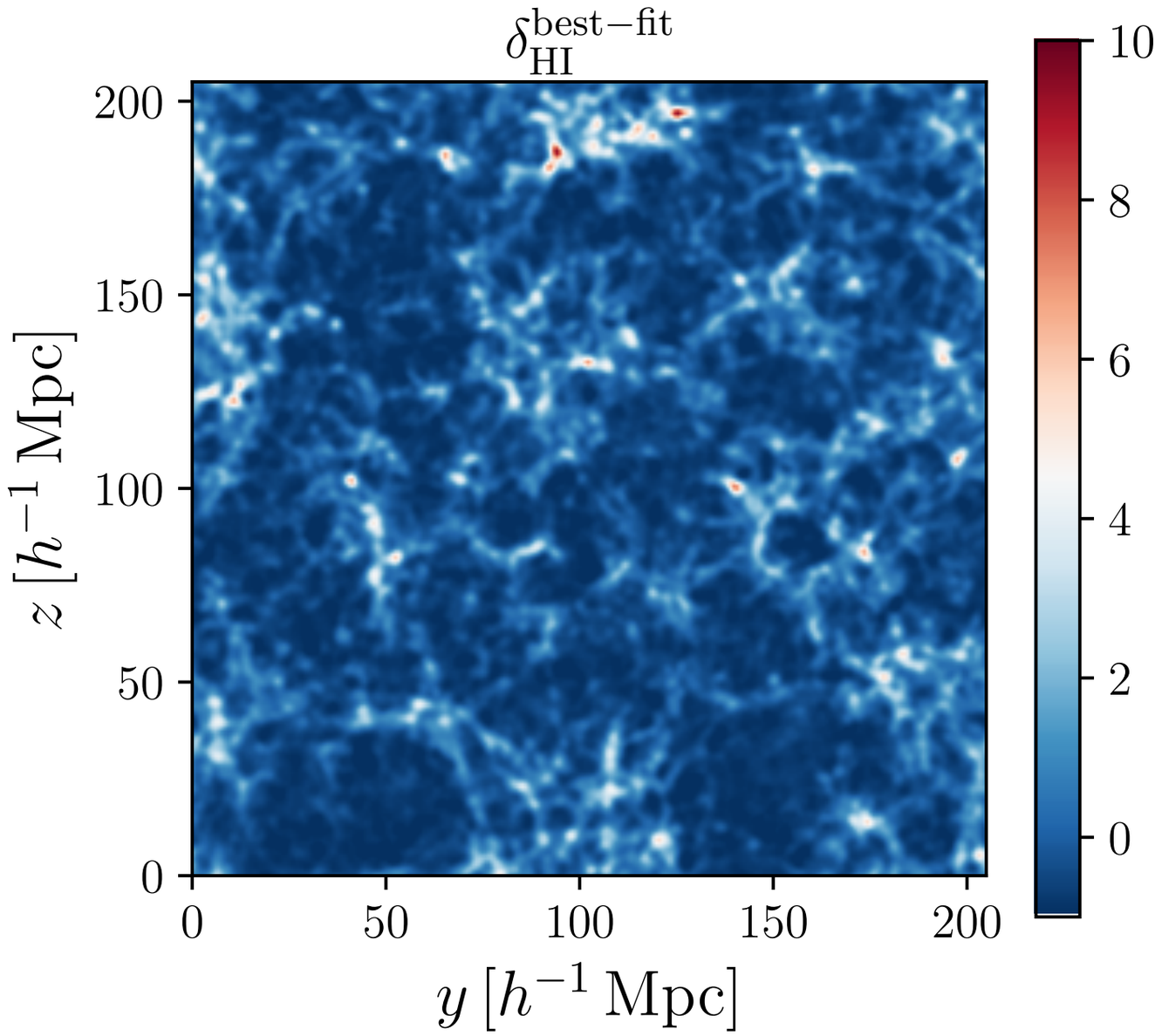
Analytical prediction with the same ICs





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Conceptual questions — what are all relevant large parameters?

$$\sigma^2 = \frac{1}{2\pi^2}\int_0^{k_*} k^2 P(k)\, dk$$

$$\sigma_v^2 = \frac{1}{6\pi^2}\int_0^{k_*} P(k)\, dk$$

$$\sigma^2_{+,n} = \frac{1}{2\pi^2}\int_{k_*}^{k_{\rm NL}} k^2 P^n(k)\, dk$$

$$\sigma^2_{-,n} = \frac{1}{2\pi^2}\int_0^{k_*} k^2 P^n(k)\, dk$$

Implications for data analysis

forward modelling vs. n-point functions

inferred errors can be very different, controlled by $\sigma^2_{+,n}$ and $\sigma^2_{-,n}$

Cabass, MS, Zaldarriaga (in prep.)