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Going beyond linear perturbations in Cosmology

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The standard approach to cosmological observables involves a homogeneous and isotropic background model on top of which small linear perturbations are considered. While the need to go beyond this first-order approach is universally recognized when dealing with cosmic structures, there are several other consequences of “going beyond linearity” which have become an important tool in cosmological analyses during the last 20-30 years and others which are still poorly explored. In this talk, I will review several examples of deviations from linearity, such as: production of primordial non-Gaussian signals, production of gravitational waves and magnetic fields out of scalar density fluctuations, production of density perturbations out of gravitational waves, as well as non-vanishing cross-correlations among seemingly independent observables.

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