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## Cosmology with galaxy surveys : the impact of non-linearity

One of the main challenges for cosmological analysis of future galaxy surveys is the non-linearity of the evolution of the large scale structure (LSS). Among the consequences of this non-linearity is the development of non-Gaussianity of the density field. And this non-Gaussianity yields new covariance terms for our observables, additional to the classical Gaussian variance that we have been used to. I will talk about these non-linear sources of errors particularly for analysis of galaxies and clusters : their origin, when do they become important, and how they make Gaussian forecasts far too optimistic for surveys like Euclid. Among them is the so-called super-sample covariance (SSC) that I will comment on in particular. I will show that SSC cannot be calibrated from the data itself or from simulations with classical covariance methods (jackknife, sims with a fixed cosmology), but I will show how to treat it analytically and realistically, i.e. with an arbitrary survey geometry. Finally I will describe a recent SSC approximation that I devised. It should allow the community to account for SSC in a numerically fast and simple way, through a modification of existing Gaussian pipelines, without needing extra elements compared to the prediction of usual LSS power spectra.

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