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Minimizing systematics with CLONES (Constrained LOcal & Nesting Environment Simulations)

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To understand dark matter and energy, large cosmological surveys are designed to reach a few percent precision. To be fully exploited, this large quantity of data needs to be analyzed in light of cosmological simulations. Preliminary analyses brought out tensions between the standard cosmological model and observations. Reaching a 1% precision, systematics of the same order of magnitude, due to our cosmic environment, our survey specificities and our tool properties, probably rise out. Analyses need to be fueled with a new type of cosmological simulations designed to reproduce our cosmic environment. Such simulations, that I named CLONES (Constrained LOcal & Nesting Environment Simulations), could provide a robust methodological framework to minimize these systematic errors. I will introduce the CLONES giving a few study examples. CLONES are a promising tool to increase our capacity to evade biases in future survey analyses.

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