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How much information can be extracted from galaxy data at the field level?

Field-level inference (FLI) of 3D galaxy data such as those from galaxy surveys or peculiar velocity surveys guarantee optimal constraints since there is no data compression (hence information loss). FLI is further tied to a forward model; such forward model also allows for flexible, modular treatment of differen astrophysical and observational effects, including but not limited to galaxy bias and redshift-space distortion. In this talk, I will present the first unbiased constraints on growth of structure with FLI from simulated data of galaxy clustering. I will further discuss ongoing developements to extend FLI to include other observables such as galaxy peculiar velocity and intrinsic shapes.

Reference: arXiv:2403.03220

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