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Relativistic cosmology on the linearized past light-cone

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One of the main challenges of theoretical physics in high-precision cosmology is to provide predictions with at least the same level of accuracy from the next surveys. In this regard, I will present a cosmological perturbation theory directly adapted to the past light-cone. Due to its adapted light-cone decomposition in scalars and pseudo-scalars (SPS), the relation to the standard scalar-vector-tensor (SVT) becomes involved, notwithstanding, I will present how one can build operators to extract the SVT information from the SPS perturbations. Moreover, I will show how the SPS perturbations provide a simple decomposition of the perturbations in E- and B- modes highlighting the adaptability of this framework to describe cosmological observables. As an application, I will show how the SPS perturbations on the light-cone provides a recipe to compute gauge invariant observables. Finally, I will apply this recipe to obtain an expression for the angular distance-redshift relation.

Topic Field

Cosmology

Faculty position

PhD student at University of Pisa

Primary authors: RODRIGUES MEDEIROS SILVA, Matheus (University of Pisa and INFN Pisa); FANIZZA, Giuseppe (IA - Lisbon); MAROZZI, Giovanni (University of Pisa and INFN Pisa)

Presenter: RODRIGUES MEDEIROS SILVA, Matheus (University of Pisa and INFN Pisa)