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New symmetries of long-wavelength cosmological perturbations : Application to gravitational lensing

The effect long wavelength cosmological perturbations (soft cosmological modes) can be captured analytically by solution-generating techniques based on large gauge diffeomorphism. This enable one to construct exact solutions of the linearized Einstein equations which described a perturbed FLRW background up to some given order in the multipole expansion of the cosmological perturbations. In this talk, I will first review this construction and I will then discuss how to identify new symmetries of these cosmological spacetimes. I will discuss that one can use these new symmetries to simplify the problem of geodesic motion and geodesic deviation in such perturbed FLRW geometry relevant for early and late time cosmology, and in particular how to go beyond the standard treatment of gravitational lensing.

Secondary track

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