Contribution ID: **15** Type: **not specified**

Introduction on relativistic projection effects on cosmological scales - Lecture 1

Friday, December 10, 2021 10:00 AM (2 hours)

Upcoming surveys will probe increasingly large scales, approaching and even exceeding the Hubble scale at the survey redshifts. On these cosmological scales, surveys can in principle provide the best constraints on dark energy and modified gravity models – and will be able to test general relativity itself. In order to realise the potential of these surveys, we need to ensure that we are using a correct analysis, i.e. a general relativistic analysis, on cosmological scales. In the first part of this lecture I will make a general overview of my research related to these effects both for the galaxy clustering and for the GWs. Then I will analyse in detail the relativistic effects which alter the observed number over-density through projection onto our past light-cone. This gives the well-known corrections from redshift space distortions and gravitational lensing convergence, but there are further Doppler, Sachs-Wolfe, integrated SW and time-delay type terms.

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