

Gravitational waves as a probe of small-scales: (Integrated) Sachs-Wolfe effect and spectral deformation

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Gravitational waves (GWs) can be a sensitive probe of the early Universe dynamics. Once GWs are produced in the very early Universe (from whatever the source), their frequency and amplitude are affected by the density fluctuations on the way of their propagation. We point out that this effect, known as (Integrated) Sachs-Wolfe effect in CMB physics, appears as the deformation of the original GW spectrum. In other words, the detection of GWs from whatever early-Universe sources works not only as a probe to high-energy GW sources themselves, but also as a probe to density fluctuations in all the intermediate scales. In this presentation we discuss how we can quantify the spectral deformation of GWs, and also discuss how sensitive the detectors should be in order to see this effect. This presentation will be based on a work with V.Domcke and H.Rubira (to appear).

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Session Classification: Short talks