

Scalar Induced Gravitational Waves: from early universe to PBH evolution

Observations of gravitational waves (GWs) have opened up a new door to study the most energetic phenomena in our Universe. Among the variety of signals that we expect to observe with current and next generation of detectors, Primordial GW offer the exciting opportunity to explore the physics of the early Universe. They are generated from quantum vacuum fluctuations and come in the form of a stochastic background (SGWB). One contribution to the latter arises from “scalar-induced” GWs (SIGWs), that are produced by second-order effects and coupling of scalar perturbations.

Moreover primordial fluctuations producing SIGWs can additionally collapse to form primordial black holes (PBHs), providing a new channel to study their formations scenario and abundance.

In this talk I will present the computation of the source term of SIGW in a generic gauge and how this can be used to probe non-standard cosmological scenarios using GW interferometers.

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