

On adiabatic renormalization and Gauge invariant backreaction in U(1)-axion inflation

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I describe a new approach to renormalize physical quantities in curved space-time introducing a comoving infrared cut-off in defining the adiabatic counterpart of the physical quantity under consideration. This infrared cut-off is fundamental to avoid unphysical divergences that can be generated by a pathological behavior of the adiabatic subtraction extended to the infrared domain. Applying such formalism to symptomatic case of U(1)-axion inflation model, we evaluate properly the expectation value of gauge contribution setting the cut-off by the conformal anomaly. We then evaluate the quantum backreaction due to gauge field. The backreaction is evaluated using a gauge invariant approach, taking in consideration inflaton fluctuations as well as scalar perturbations of the metric.

Presenter: CONZINU, Pietro (CERN/INFN Pisa)