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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.

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