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# Scalar perturbations from (thermal) stochastic sources [Chair: Fumagalli]

*Tuesday, 28 May 2024 12:00 (45 minutes)*

We discuss the calculation of the power spectrum of scalar perturbations in the presence of stochastic source terms, providing insight on the expected outcome based on analytical approximations. We then focus on the case of warm inflation. In this scenario, the coupling of the inflaton to light fields during inflation leads to the former dissipating part of its energy into a thermal bath. The thermal fluctuations of this bath act as a stochastic source for inflaton perturbations, enhancing the inflationary scalar power spectrum and therefore increasing the predicted abundance of primordial black holes (and the corresponding scalar-induced gravitational waves), as well as modifying the CMB observables. We propose new numerical techniques based on the Fokker-Planck equation that improve both the precision and the computational efficiency of previous methods. Finally, we compare this setup with that of stochastic inflation, in which the backreaction of inflaton quantum fluctuations on the background is also modelled through stochastic terms.

Based on 2208.14978 and 2304.05978 with G. Ballesteros, M.A.G. García, M. Pierre, J. Rey.

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