« Atelier sur les relations de fluctuation entropique en mathématiques et physique »
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Hydrodynamic fluctuations in Euler scaling and beyond, with boundary tension

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We consider the equilibrium dynamics of a chain of non-linear oscillators (FPU type) perturbed by a noise conserving volume, momentum and energy, and with a constant tension force applied on the boundaries. We prove that, after hyperbolic scaling of space and time, the fluctuation fields of the conserved quantities (volume stretch, momentum and energy) evolve deterministically following linearized Euler equations with boundary conditions. This deterministic evolution is still valid beyond hyperbolic time scale, but well shorter that the time scale where superdiffusion of the heat mode should appear. The proof of the linearization (so called Boltzmann-Gibbs principle) relays on a uniform lower bound on the spectral gap of the generator of the noise.

Work in collaboration with Lu Xu.

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