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Forum de Physique Statistique @ ENS

Mercredi 1 Décembre 2021, 14 :30
LPENS, L367(please inquire xiangyu.cao@ens.fr for a zoom link)
Domaines : cond-mat.stat-mech

Titre : *Quantum bounds and fluctuation-dissipation theorem*

Orateur : **Silvia Pappalardi (LPENS)**

Résumé : *In recent years, there has been intense attention on the constraints posed by quantum mechanics on the dynamics of the correlation at low temperatures, triggered by the postulation and derivation of quantum bounds on the transport coefficients or the chaos rate. However, the physical meaning and the mechanism enforcing such bounds is still an open question. In this talk, I will discuss the quantum fluctuation-dissipation theorem (the KMS conditions) in relation to the bounds on correlation time scales. First of all, I will map out-of-time correlation functions onto ordered two-point functions in a replicated space. This allows for a simple derivation of the quantum bound to chaos as a direct consequence of the KMS condition. Secondly, I will describe how quantum fluctuation-dissipation relations act in general as a blurring of the time-dependence of correlations, which can imply bounds on their decay rates. Thinking in terms of fluctuation-dissipation opens a direct connection between bounds and other thermodynamic properties.*