

Quantum thermostatted disordered systems and sensitivity under compression

We consider a one-dimensional quantum system with off diagonal disorder, consisting of a sample of conducting regions

randomly interspersed within potential barriers.

Results mainly concerning the large N limit are presented and it is shown that the disordered model converges to the periodic case as the number of barriers increases, with a rate of convergence which depends on the disorder degree. In particular, the effect of compression on the transmission coefficient is investigated. Compression always leads to a decrease of the transmission coefficient which may be exploited to design nanotechnological sensors. Effective choices for the physical parameters to improve the sensitivity are provided and eventually large fluctuations and rate functions are analysed, which can be used to reveal the compression state of the system.

Moreover, a numerical method to simulate such a system, for a physically relevant number of barriers, is proposed.

Primary authors: LAMBERTO, Rondoni (Politecnico di Torino); VANZAN, Tommaso (University of Geneva)

Presenter: VANZAN, Tommaso (University of Geneva)