Condensed Matter > Statistical Mechanics

Exact results for anomalous transport in one dimensional Hamiltonian systems

Henk van Beijeren

(Submitted on 16 Jun 2011 (v1), last revised 8 Mar 2012 (this version, v4))

Anomalous transport in one dimensional translation invariant Hamiltonian systems with short range interactions, is shown to belong in general to the KPZ universality class. Exact asymptotic forms for density-density and current-current time correlation functions and their Fourier transforms are given in terms of the Pr\"ahofer-Spohn scaling functions, obtained from their exact solution for the Polynuclear growth model. The exponents of corrections to scaling are found as well, but not so the coefficients. Mode coupling theories developed previously are found to be adequate for weakly nonlinear chains, but in need of corrections for strongly anharmonic interparticle potentials.

Comments:	Further corrections to equations have been made. A few comments have been added, e.g. on the non-applicability to exactly solved models
Subjects:	**Statistical Mechanics (cond-mat.stat-mech)**; Mathematical Physics (math-ph); Chemical Physics (physics.chem-ph); Fluid Dynamics (physics.flu-dyn)
Cite as:	**arXiv:1106.3298 [cond-mat.stat-mech]** (or **arXiv:1106.3298v4 [cond-mat.stat-mech]** for this version)

Submission history

From: Henk Beijeren van [view email]
[v1] Thu, 16 Jun 2011 18:28:22 GMT (9kb)
[v2] Sat, 18 Jun 2011 15:03:03 GMT (9kb)
[v3] Thu, 6 Oct 2011 02:07:31 GMT (9kb)
[v4] Thu, 8 Mar 2012 09:15:16 GMT (9kb)

Which authors of this paper are endorsers?