Heat transport in quantum spin chains: the relevance of integrability[1] JINSHAN WU, MONA BERCIU, UBC — Heat transport in quantum spin chains is investigated through the master equation in Lindblad form derived from the Schroedinger equation of a system coupled with two baths via the projector operator technique. We find that the Fourier's Law of heat transport is obeyed in some systems. Although a general proof has not been established, after a survey of various quantum spin chains, our results suggest the criteria of anomalous heat transport is not the integrability of the Hamiltonian, but whether or not it can be mapped to non- interacting fermions.

Jinshan Wu
UBC

Date submitted: 24 Nov 2008   Electronic form version 1.4