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Mathematical Physics

Resonances for "large" ergodic systems in one dimension: a review

Frédéric Klopp (LAGA)

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The present note reviews recent results on resonances for one-dimensional quantum ergodic systems constrained to a large box. We restrict ourselves to one dimensional models in the discrete case. We consider two type of ergodic potentials on the half-axis, periodic potentials and random potentials. For both models, we describe the behavior of the resonances near the real axis for a large typical sample of the potential. In both cases, the linear density of their real parts is given by the density of states of the full ergodic system. While in the periodic case, the resonances distribute on a nice analytic curve (once their imaginary parts are suitably renormalized), In the random case, the resonances (again after suitable renormalization of both the real and imaginary parts) form a two dimensional Poisson cloud.

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