

Spectra of analytic hyperbolic maps and flows: Correlation functions, Fredholm determinants and zeta-functions.

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We define a class of so-called ‘Hyperbolic Analytic Maps’. Given a map in this class we associate a Banach space and a family of transfer operators with analytic weights on the space. These operators are nuclear in the sense of Grothendieck. We provide an elementary proof in the case of 1+1 dimensional maps [Fried has extended the proof to higher dimensional systems]. In this case such an operator admits a Fredholm determinant which is an entire function in the complex plane.

Applying a judicious choice of weights we may relate the zeroes of a determinant to resonances for certain ergodic measures on the underlying dynamical system. In particular, we consider real-analytic Anosov maps or Axiom A attractors (still in 1+1 dimensions) with their SRB (or natural) measure and show that the SRB-resonances form a discrete subset of the complex plane and are localized in the zero-set of a Fredholm determinant.

Regarding an Axiom A flow as a suspension of a ditto map we prove similar results for the SRB-resonances in the flow case.

References: <http://www.iop.org/EJ/article/0951-7715/5/6/003/no920603.pdf>

V Baladi: Positive transfer operators and decay of correlations World Scientific (2000), pp 269-288