

Workshop on Spectrum and Dynamics
Atelier sur la dynamique et théorie spectrale
07–11 April/*Avril*, 2008

Semi-classical approach for hyperbolic dynamical systems and Ruelle resonances

Frédéric FAURE
Institut Fourier
Université Joseph Fourier
BP 74
38402 Saint-Martin d'Hères
FRANCE

`frederic.faure@ujf-grenoble.fr`

Abstract

We will explain how some spectral properties of Anosov diffeomorphisms can be obtained by semi-classical analysis. In particular the Ruelle resonances which are eigenvalues of the Ruelle transfer operator acting in suitable anisotropic Sobolev spaces and which govern the decay of dynamical correlations, can be treated as the quantum resonances of open quantum systems in the Aguilar-Baslev-Combes theory or the more recent Helffer-Sjöstrand phase-space theory. This work has been done with Nicolas Roy and Johannes Sjöstrand (arXiv:0802.1780v2 [nlin.CD]) and proposes a semi-classical approach after the recent works of M. Blank, S. Gouzel, G. Keller, C. Liverani and V. Baladi and M. Tsujii. With a simple model, we will also explain how this approach may be useful to describe the spectral gap in partially hyperbolic dynamical systems.