RELATIONS BETWEEN CLASSICAL RESONANCES AND QUANTUM RESONANCES IN CONSTANT NEGATIVE CURVATURE

by

Colin Guillarmou

In this minicourse, we will define the notion of Ruelle resonance for the geodesic flow on a constant negatively curved manifold $M$. These are essentially eigenvalues of the vector field $X$ generating the geodesic flow on the unit tangent bundle $SM$ on certain functional spaces. We will show an explicit relation between these eigenvalues of $X$ and the corresponding eigenfunctions with eigenvalues of some quantum operators, typically some Laplacians on certain bundles on $M$. We will also explain how quantum ergodicity is related to equidistributions of traces of spectral projectors (or Patterson-Sullivan distributions) of Ruelle resonances at high frequencies.