
DIMITRI JAKOBSEN, McGill, Dept. of Math, 805 Sherbrooke W, Montreal, QC, H3A 2K6, Canada

Estimates from below for spectral function and error term in Weyl law

We obtain asymptotic lower bounds for the spectral function of the Laplacian on compact manifolds. In the negatively curved case, thermodynamic formalism is applied to improve the estimates. Our results can be considered pointwise versions (on a general manifold) of Hardy's lower bounds for the error term in the Gauss circle problem. We next obtain a lower bound for the remainder in Weyl's law on negatively curved surfaces. On higher-dimensional negatively curved manifolds, we prove a similar bound for the oscillatory error term. Our approach uses wave trace asymptotics, equidistribution of closed geodesics and small-scale microlocalization.