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**Xiaolong Han\***, Department of Mathematics, Australian National University, Canberra, ACT 2601, Australia. *Small scale quantum ergodicity in negatively curved manifolds.*

Quantum ergodicity is the study of how the ergodicity (or chaos, i.e. with exponential instability) of a classical Hamiltonian system is reflected in its corresponding quantum system. For example, what implication does ergodicity (or chaos) of the geodesic flow on a compact Riemannian manifold have on the Laplacian eigenfunctions? The quantum ergodic theorem states that, if the geodesic flow is ergodic, then a full density subsequence of eigenfunctions tend equidistributed asymptotically in any fixed region. In negatively curved manifolds, the geodesic flows display stronger chaotic properties than ergodicity. It has further implication on its quantum system. Using the property of exponential decay of correlation, we prove that the asymptotic equidistribution can be improved to regions of small scales (e.g. balls logarithmically shrinking to points). (Received September 17, 2015)