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Alexandre Girouard* (girouard@dms.umontreal.ca). *Fundamental tone, volume concentration and conformal degeneracy.*

We discuss some properties of the first eigenvalue of the Laplacian under conformal degeneration of the metric. Consider a sequence of conformally equivalent Riemannian metrics on a closed surface of fixed area that concentrates at a point. Then the corresponding sequence of first eigenvalues is bounded above by the first eigenvalue of the round sphere. This estimate is optimal. We also prove the following related result proposed by Nadirashvili. Consider a sequence of conformal classes on a torus that tends to the boundary of the moduli space. Then the suprema of the first eigenvalue for metrics of fixed area in each conformal class tend to the first eigenvalue of the round sphere. (Received December 12, 2005)