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Donato R. Cianci* (dcianci@math.dartmouth.edu). *On hearing the length spectrum of lens spaces*. Preliminary report.

The spectrum of the Laplace-Beltrami operator on a compact Riemannian manifold is known to encode geometric data. For instance, the dimension and volume of the manifold can be recovered from the Laplace spectrum. The length spectrum of a compact Riemannian manifold is the list of the lengths of closed geodesics, i.e., the lengths of the periodic orbits of the geodesic flow. Motivated by the quantum correspondence principle, we have the following question: Is the length spectrum of a Riemannian manifold determined by the spectrum of the Laplacian? The answer is known to be affirmative for generic metrics. However, the answer is not known for manifolds of constant positive curvature. In this talk we will show that for homogeneous lens spaces and lens spaces with small fundamental group the length spectrum can be recovered from the Laplace spectrum. (Received September 22, 2015)