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The fundamental gap of convex domains in hyperbolic space revisited

The difference between the first two eigenvalues of the Dirichlet Laplacian on convex domains of $\mathbb{R}^n$ and, respectively $\mathbb{S}^n$, satisfies the same strictly positive lower bound depending on the square of the diameter of the domain. In work with collaborators, we have found that the gap of the hyperbolic space on convex domains behaves strikingly different even if a stronger notion of convexity is employed. This is very interesting as many other features of first two eigenvalues behave in the same way on all three spaces of constant sectional curvature. We will discuss the possibility of a different lower bound on the fundamental gap in the hyperbolic space. (Based on joint work with T.Bourni, J.Clutterbuck, H.Nguyen, G.Wei and V.Wheeler.)