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On the Poisson relation for symmetric spaces

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Motivated in part by considerations from quantum mechanics, it is a long-standing folk-conjecture that the spectrum of a manifold determines its length spectrum (i.e., the set consisting of the lengths of closed orbits of the associated geodesic flow). This conjecture is known to be true for sufficiently "bumpy" manifolds; however, our understanding in the homogeneous setting - where closed geodesics occur in large families - is rather incomplete. In this talk we will discuss our current program to use wave trace techniques to explore the validity of this conjecture in the case of compact symmetric spaces. In particular, we will confi□rm the conjecture for compact simple Lie groups equipped with a bi-invariant metric (and, more generally, irreducible symmetric spaces of splitting rank) by showing that the Poisson relation is an equality.

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