Graduate

Dynamical Systems Seminar

On the generic spectrum of the G-manifolds

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Abstract. When M is a compact G-manifold equipped with a G-invariant Riemannian metric, it is evident that the real eigenspaces of the Laplacian operator on M are orthonormal representations of G. A natural conjecture is that, for generic G-invariant metric, the eigenspaces should be irreducible. In this conference we study the generic spectrum of G-manifolds in general and others related problems. Compact Lie groups (and homogeneous space in general) are examples of the extreme case considered. Schueth established in [2] an algebraic criterium for the existence of left invariant metrics g on G such that each eigenspace of the Laplacian is irreducible under the action of G. In [1], we combine Schueth's criterium and analytical tools to prove the conjecture for a more general class of G-manifolds that contain for example principal bundles. If time allows, we will explore some interesting G-Riemannian manifolds where the eigenspaces are not irreducible and we will try to give a algebraic structural reason for this.

This is joint work with José Nazareno Vieira Gomes, Federal University of Amazonas.

References

[1] J. N. V. Gomes and M. A. M. Marrocos *Generic Spectrum of Warped Products and G-Manifolds*, J Geom Anal (2018)

[2] D. Schueth: *Generic irreducibilty of Laplace eigenspaces on certain compact Lie groups*, Ann. Glob. Anal. Geom. 52 (2017) 187–200.

[3] S. Zelditch On the generic spectrum of a riemannian cover, Ann. Inst. Fourier (Grenoble) 40 (1990) 407–442