Maximizers for Spherical Restriction

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This talk is based on recent results obtained in [1]. We prove that constant functions are the unique real-valued maximizers for a large number of $L^2 - L^{2n}$ adjoint Fourier restriction inequalities on the unit sphere $\mathbb{S}^{d-1}$, $d \in \{3, 4, 5, 6, 7\}$, which in particular contains the sharp instances of the corresponding $L^2 - L^6$ and $L^2 - L^8$ inequalities. The proof brings together tools from probability theory, functional analysis, and Lie theory. It also relies on general solutions of the underlying Euler–Lagrange equation being smooth, a fact of independent interest which we discuss. We further show that complex-valued maximizers coincide with nonnegative maximizers multiplied by the character $e^{i\xi\cdot\omega}$, for some ξ, thereby extending the main results of [2] to higher dimensions and general even exponents.

References

[1] D. Oliveira e Silva and R. Quilodrán, Global maximizers for adjoint Fourier restriction inequalities on low dimensional spheres, preprint, 2019.

[2] M. Christ and S. Shao, On the extremizers of an adjoint Fourier restriction inequality, *Adv. Math.* **230** (2012), no. 3, 957–977.