



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

M. E. Taylor Analysis and PDE Seminar

Wednesday, September 25th
3:30 - 4:30 p.m.
Phillips Hall 385

Upper bounds of second eigenvalues on the sphere and the real projective space

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Abstract. In this talk, we discuss sharp upper bounds for the second nonzero eigenvalue of the Laplacian on higher dimensional spheres and real projective spaces. These isoperimetric inequalities are applications of classical isoperimetric problem and extending this problem to optimizing a certain physical quantity, which is the eigenvalue. Our method consists of constructing trial functions based on recent developments in the hyperbolic center of mass and on topological degree theory used to verify that the trial functions are valid. We lastly talk about one-step method of proving that the trial functions satisfy orthogonality conditions.