

# Maximization of the second eigenvalue of the fractional laplacian

October 19, 2021

## Abstract

In the first part of the talk, we discuss symmetry property of second eigenfunctions of annulus. We prove that for an annulus with a sufficiently large hole, a second eigenfunction cannot be radial. This gives a partial answer to a conjecture by Bunuelos and Kulczycki on the shape of second eigenfunctions of annuli. In the second parts we consider the maximization of the second eigenvalue in simply connected domains bounded by two spheres and prove that the maximum is attained by concentric spheres.

The talk is based on two papers: A fractional Hadamard formula and Applications joint with M.M. Fall and Tobias. Weth; Symmetry of odd solutions to equations in involving the fractional laplacian joint with Sven Jarohs .