

1057-35-334

Richard S Laugesen and **Bartłomiej A Siudeja*** (siudeja@illinois.edu), Department of Mathematics, University of Illinois, Urbana, IL 61801. *Sums of Dirichlet eigenvalues: minimizing with equilateral triangles.* Preliminary report.

We prove that among all triangles with fixed diameter the sum of Dirichlet eigenvalues $\lambda_1 + \cdots + \lambda_n$ is minimal for equilateral triangles, for each n .

For the first eigenvalue, stronger results are known: area or perimeter can be fixed instead of diameter. Neither result is true for the sum of the first two eigenvalues, let alone for just the second eigenvalue. We prove that the second eigenvalue is minimal for equilateral triangles, when diameter is fixed.

This result supports the spectral gap conjecture that $\lambda_2 - \lambda_1$ is minimal among triangles for the equilateral one, under diameter normalization, as conjectured by Freitas and Antunes. Our result also provides evidence for the conjecture of Bucur, Buttazzo and Henrot, that λ_2 is minimal for disks among all convex domains having fixed diameter. (Received January 25, 2010)