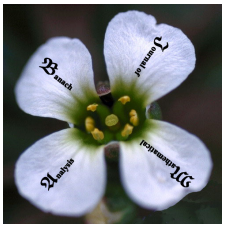

Banach J. Math. Anal. 2 (2008), no. 2, 68–75

Banach Journal of Mathematical Analysis
ISSN: 1735-8787 (electronic)
http://www.math-analysis.org

AN EIGENVALUE PROBLEM WITH MIXED BOUNDARY CONDITIONS AND TRACE THEOREMS

CATHERINE BANDLE[1]

This paper is dedicated to Professor J. E. Pecaric

Submitted by P. K. Sahoo

Abstract. An eigenvalue problem is considered where the eigenvalue appears in the domain and on the boundary. This eigenvalue problem has a spectrum of discrete positive and negative eigenvalues. The smallest positive and the largest negative eigenvalue $\lambda_{\pm 1}$ can be characterized by a variational principle. We are mainly interested in obtaining non trivial upper bounds for λ_{-1}. We prove some domain monotonicity for certain special shapes using a kind of maximum principle derived by Bandle, v. Bellow and Reichel in [J. Eur. Math. Soc., 10 (2007), 73–104]. We then apply these bounds to the trace inequality.

[1] Department of Mathematics, University of Basel, Rheinsprung 21, CH-4051 Basel, Switzerland.
E-mail address: catherine.bandle@unibas.ch

Date: Received: 21 April 2008; Accepted 20 May 2008.
2000 *Mathematics Subject Classification.* Primary 35P15, 47A75 ; Secondary 49R50, 51M16.
Key words and phrases. Estimates of eigenvalues, trace inequality, comparison theorems for eigenvalues.