Electronic Journal: Southwest Journal of Pure and Applied Mathematics
Internet: http://rattler.cameron.edu/swjpam.html
ISSN 1083-0464
Issue 2, December 2002, pp. 68–76.
Submitted: April 2, 2002. Published: December 31 2002.

ON SEMILINEAR ELLIPTIC EIGENVALUE PROBLEM WITH EIGENPARAMETER IN THE BOUNDARY CONDITIONS

S. F. M. Ibrahim

Abstract. The object of this paper is to establish the expansion theorem for a semilinear elliptic eigenvalue problem of a simply connected bounded domain in $R^n, (n \geq 2)$, where the eigenvalue parameter λ is contained in the semilinear elliptic partial differential equation and in the boundary conditions. We associated with this problem a semilinear self-adjoint operator S in a suitably defined Hilbert space H and then we develop an associated eigenfunction expansion theorem.

1991 A.M.S. (MOS) Subject Classification Codes. 35J60, 35P10, 47F05.

Key Words and Phrases. Semilinear elliptic eigenvalue problem, eigenvalue parameter in boundary conditions, semilinear operator, Hilbert space formulation, eigenfunction expansion theorem.

Department of Mathematics, Faculty of Education, Ain Shams University, Roxy, Cairo, EGYPT
E-mail Address: sfmibrahim @hotmail.com
©2002 Cameron University

Typeset by $\mathcal{AMS}$-TEX