

LAX-MILGRAM THEOREM AND APPLICATIONS TO PERTURBED LAPLACE PROBLEM WITH DIRICHLET CONDITIONS

Abstract. Using Lax-Milgram theorem, it is studied the problem

$$\begin{cases} -\Delta u + u + Au = f & \text{on } D \\ u = 0 & \text{on } \partial D \end{cases}, \quad (1)$$

where $D \subset \mathbf{R}^n$ is open and $A : D(A) \subset L^2(D) \rightarrow L^2(D)$ is given. The results from this paper generalize the well known case $A = 0$ (e.g. [1]). The linear case is considered, then analogue results can be established in nonlinear case as variational inequalities. Finally, some applications are given.

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