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M. N. Nkashama* (nkashama@math.uab.edu), Department of Mathematics, University of Alabama at Birmingham, AL 35294-1170, and Nsoki Mavinga (mavinga@math.uab.edu), Department of Mathematics, University of Alabama at Birmingham, Birmingham, AL 35294-1170. Steklov Eigenproblem and Elliptic Equations with Nonlinear Boundary Conditions.

We will present existence and non-existence results for second order elliptic partial differential equations with nonlinear boundary conditions. The nonlinearity on the boundary interacts in sense with the first eigenvalue of the Steklov spectrum. Our approach is based on a priori estimates and topological degree arguments. A connection with some variational arguments will also be established. (Received September 10, 2007)