

**A NONLINEAR EIGENVALUE PROBLEM WITH
INDEFINITE WEIGHTS RELATED TO THE SOBOLEV
TRACE EMBEDDING**

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Abstract

In this paper we study the Sobolev trace embedding $W^{1,p}(\Omega) \hookrightarrow L^p_V(\partial\Omega)$, where V is an indefinite weight. This embedding leads to a nonlinear eigenvalue problem where the eigenvalue appears at the (nonlinear) boundary condition. We prove that there exists a sequence of variational eigenvalues $\lambda_k \nearrow +\infty$ and then show that the first eigenvalue is isolated, simple and monotone with respect to the weight. Then we prove a nonexistence result related to the first eigenvalue and we end this article with the study of the second eigenvalue proving that it coincides with the second variational eigenvalue.

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