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Title: The principal eigenvalue and the maximum principle for degenerate elliptic operators

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Abstract: I will report on research in collaboration with Berestycki, Porretta and Rossi [1] and with Birindelli and Camilli [2]. An extended notion of principal eigenvalue is introduced in [1] in the general framework of fully nonlinear degenerate elliptic operators; the positivity of this number is shown to be equivalent to the validity of the maximum principle (or sign propagation property). Under stronger ellipticity conditions we proposed in [2] some finite differences schemes to compute this number by means of Collatz-Wielandt type formula. It is worth to point out that numerical approaches to the computation of eigenvalues are usually based on finite elements approximations of the classical Rayleigh-Ritz formula, therefore requiring divergence structure of the operator which is not required in our approach.

H. Berestycki, A. Porretta, L. Rossi, ICD, Maximum Principle and generalized principal eigenvalue for degenerate elliptic operators, JMPA 2014

I. Birindelli, F. Camilli, ICD, On the approximation of the principal eigenvalue for a class of nonlinear elliptic operators, submitted